[5/2/78-1978 Energy Supply Initiatives]

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THE WHITE HOUSE
WASHINGTON

May 2, 1978

Secretary Schlesinger
Jim McIntyre
Stu Eizenstat

The attached was returned in the President's outbox. It is forwarded to you for appropriate handling.

Rick Hutcheson

1978 SUPPLY INITIATIVES

cc: The Vice President
Hamilton Jordan
Charlie Schultze
Frank Press
Charles Warren

	FOR STAFFING
	FOR INFORMATION
✓	FROM PRESIDENT'S OUTBOX
	LOG IN/TO PRESIDENT TODAY
	IMMEDIATE TURNAROUND
	NO DEADLINE
	LAST DAY FOR ACTION -

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	EYES ONLY

ACTION	FYI	
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✓		EIZENSTAT
	✓	JORDAN
		KRAFT
		LIPSHUTZ
		MOORE
		POWELL
		WATSON
		WEXLER
		BRZEZINSKI
✓		MCINTYRE
	✓	SCHULTZE

		ADAMS
		ANDRUS
		BELL
		BERGLAND
		BLUMENTHAL
		BROWN
		CALIFANO
		HARRIS
		KREPS
		MARSHALL
✓		SCHLESINGER
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		VANCE

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		COSTANZA
		CRUIKSHANK
		FALLOWS
		FIRST LADY
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		HARDEN
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	✓	PRESS
		SCHNEIDERS
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	✓	WARREN
		WISE

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Department of Energy
Washington, D.C. 20585

Jim - Jim - Stu

I prefer to hold the 1979 budget levels down as much as possible, and see no need for increases now. Let's see how NEP goes, & use veto if necessary

April 26, 1978

P.S. My impression I was that the SR2 was preferable - J

MEMORANDUM FOR: THE PRESIDENT

FROM: JIM SCHLESINGER

SUBJECT: 1978 Supply Initiatives

DOE is developing a comprehensive National Energy Supply Strategy which will be ready early next year. In the interim, a number of initiatives can be recommended for inclusion in the FY 1979 budget. Attached for your review is a description of these energy supply initiatives.

This document has been made available to OMB and other Federal agencies. The OMB recommendation on these initiatives is due to you this week. We hope to be able to send this package to Congress by the end of the first week of May.

I believe that a program along the lines described in the attached document is necessary to gain momentum in energy supply. The Congress is already beginning to add supply initiatives to the fiscal year 1979 budget.

If we fail to seize the initiative, we will be bound by significant congressional increases without Administration priorities, and it will appear to the public that the Administration has lost the lead in energy policy.

McINTYRE
DECISION
MEMO

EXECUTIVE OFFICE OF THE PRESIDENT

OFFICE OF MANAGEMENT AND BUDGET

WASHINGTON, D.C. 20503

May 1, 1978

ACTION

MEMORANDUM FOR: THE PRESIDENT

FROM: JAMES T. McINTYRE, JR.

SUBJECT: DOE Energy Supply and Sun Day Initiatives

I. BACKGROUND

The Department of Energy has proposed a package of initiatives for FY 1979-1984 resulting from its "8-Week" supply study. This package includes:

- Coal liquefaction and other non-renewable initiatives ($249 M in 1979 and $1.5 B through 1984).
- Tax credits for oil shale and small coal technologies ($340 M through 1984).
- Solar and other renewable initiatives ($100 M in 1979 and $680 M through 1984).

In addition, CEQ is proposing additional solar initiatives ($30 M in 1979 and $315 M through 1982).

These energy supply initiatives should be reviewed in light of (1) your 1979 Budget and out year budget implications; (2) current negotiations on the National Energy Act (NEA); and (3) the relative contribution of the initiatives to energy supply.

II. ESSENTIAL CONSIDERATIONS

These are the essential considerations you should keep in mind in reviewing these DOE and CEQ proposals.

A. Outlook for 1980

First, as Table 1 indicates, the March adjusted base for the DOE FY 1980 budget is $11.5 B. It is from that base (as in other agencies) that reductions must be made if we are to show a significant reduction in the budget deficit from FY 1979 to FY 1980. Government-wide, as we have told you, we must reduce that March base by at least $15 B; since DOE's programs are largely "controllable," we will have to reduce DOE's projected $11.5 B by $1 B or more.

Budget Impact of Energy Programs
(billions of dollars)

	1978		1979		1980		1981		1982	
	BA	O	BA	O	BA	O	BA	O	BA	O
Department of Energy										
March Base (Adjusted from FY 1979 Budget)	10.3	7.1	11.6	10.2	9.4	11.5	8.6	8.6	8.5	8.1
Congressional Threats (Likely NEA and FY 1979 Authorization add-ons)			-0.4	+0.8	+2.6	+2.7	+1.4	+1.3	+1.2	+1.3
8-Week Initiatives (DOE)	--	--	+0.4	+0.2	+0.6	+0.4	+0.4	+0.4	+0.3	+0.2
8-Week Initiatives (CEQ)	--	--	--	--	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1
Preliminary 1980 Proposals (DOE)	--	--	--	--	+1.8	+1.3	+2.6	+1.9	+2.3	+2.1
Total Potential DOE	10.3	7.1	11.6	11.2	14.5	16.0	13.1	12.3	12.4	11.8

TABLE 1

The trend, as Table 1 indicates, clearly is running in the opposite direction. After adding

- The DOE/CEQ supply initiatives (the subject of this memo);
- Preliminary FY 1980 initiatives provided by DOE;
- Potential Congressional add-ons to the DOE base program in the DOE FY 1979 Authorization Bill; and
- The likely ultimate cost of the NEP/NEA after compromises

to that $11.5 B base, the total DOE FY 1980 budget could be as high as $16.0 B in outlays.

DOE has told us that the most it can expect to cut out of that $11.5 B is $300-400 M--about the amount of their proposals, and far less than the amount likely to be added by the Congress. The vital budget objective, you will recall, is to get below the $11.5 B base--not to stay even with it or to go above.

As evidence of the good-faith effort the Department is willing to make at reducing the base, DOE will point to its plan to reduce FY 1980 production costs for uranium enrichment by $250 M by slipping the construction schedule for the first centrifuge plant. We note, however, that for the same reason that the centrifuge schedule is being slipped (lagging need and demand for enriched uranium), DOE has already granted contract relief to existing enrichment customers--resulting in lost FY 1980 DOE revenues of $500 M. Thus, the effect of both actions is an addition to the net DOE FY 1980 budget of about $250 M.

Politically, the question you face is whether to address the overall budget deficit issue or the component issues, such as the energy budget, on an issue by issue basis. In my view, the political dimensions of the whole are far greater than the sum of the parts.

B. Congressional Budget Threats and Strategy

Proposed increases resulting from the FY 1979 Congressional authorization process could total as much as $800 M in FY 1979 outlays. However, with expected help from the appropriations committees the final add-ons for all energy R&D can be held to $200 to $350 M. But the appropriations committees need full Administration support to hold off the larger increases.

We should not treat the issue in the same manner as we did the 1977 Farm Bill--bargaining up and, in the process, fueling the demands for more Federal dollars. The result of that strategy was a farm measure that will cost us $5-7 B more in FY 1979 than we were prepared to spend.

Rather, I would urge that we follow a strategy similar to that which we are more successfully pursuing in this year's farm bill debate--strong defense

of the Administration's program while holding the line firmly against unnecessary increases. The total DOE energy budget, including strategic oil reserves, has been increased by 91% from 1977 to 1979, and by 16% from 1978 to 1979. The non-nuclear energy research and development budget has been increased by 62% from 1977 to 1979. The solar budget has been increased already by 25% from 1978 to 1979.

C. Impact on the NEA Negotiations

Offering substantial supply initiatives to the Congress while NEA negotiations are still in process could undermine the Administration's bargaining position. This is particularly the case where tax credits are concerned. The Administration has been holding firm against the Senate tax credits for energy supply. We could negotiate a better compromise on tax credits if we did not offer up the tax credit supply initiatives now.

III. Conclusions

This Administration already has made major commitments to help increase energy supply options. To illustrate:

- The recent tentative House/Senate compromise on natural gas legislation provides an additional $22-23 B in revenues to producers between 1978-85 over the House bill ($6 B over the "base case").

- DOE, on an informal basis, has offered producers about $35 B in revenues for 1978-85 as an incentive to gain their support for COET.

- The Senate energy bill includes $15 B in tax credits to encourage new energy supply. We believe that the majority of these credits are likely to end up in the final bill.

- Energy supply research, development and demonstration activities already committed to by DOE will cost about $22 B between now and 1985.

- This incresse in Federal spending and revenues to industry will, between now and 1985, total nearly $100 B.

In summary, the Administration has already committed to major and costly U.S. actions to encourage domestic energy supply. Recognizing this, the additional proposed energy supply initiatives are not essential at this time. In addition, the DOE energy budget has the potential for major increases in the future, and the budgetary impacts of the NEA are very large but still uncertain. Our recommendations attempt to preserve your option to approach a balanced budget in the future, while providing a politically saleable and effective package of energy supply initiatives in the near term.

IV. Issues for Decision

Your decisions are requested on five issues related to these energy initiatives. We have categorized these proposals as non-renewable and renewable and we have provided an introduction overview for each set. The following table summarizes the costs associated with these issues:

(See Chart on next page.)

Attachments

Summary of Agency and OMB Recommendations

($ in millions)

	1979		1980		1981		1982		1983		1984		Total	
	BA	BO	BA	BO	BA	BO	BA	BO	BA	BO	BA	BO	BA	BO
Issue #A1: Solvent Refined Coal														
DOE	192	59	156	148	75	200	61	90	96	70	64	45	644	612
OMB	37	25	0	12	0	0	0	0	-37	-37	0	0	0	0
High BTU Gas (Not an Issue)														
DOE	30	2	248	12	146	4	102	4	0	0	0	0	526	22
OMB	30	2	248	12	146	4	102	4	0	0	0	0	526	22
Issue #A2: Unconventional Gas														
DOE	27	25	58	54	18	23	0	1	0	0	0	0	103	103
OMB	10	5	10	10	10	10	0	5	0	0	0	0	30	30
Issue #A3: Oil Shale and ACT Tax Credits														
DOE	--	(0)	--	(0)	--	(41)	--	(82)	--	(93)	--	(104)	--	(320)
OMB	--	(0)	--	(0)	--	(11)	--	(22)	--	(33)	--	(44)	--	(110)
Issue #B1: DOE 8-Week Renewable														
DOE	100	80	132	135	114	119	136	123	112	114	86	90	680	661
OMB	25	20	25	25	25	30	25	25	25	25	25	25	150	150
Issue #B2: CEQ Sun Day Initiatives														
CEQ	30	22	65	61	95	92	125	121	155	165	175	175	645	636
OMB	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Budget Impact*														
DOE/CEQ	379	188	659	410	448	479	424	421	363	442	325	414	2598	2354
OMB	102	52	283	59	181	55	127	56	-12	21	25	69	706	312

( ) = Tax Revenues Lost
* Includes last tax revenues.

TAB A

[redacted]

TAB A

INTRODUCTION TO NON-RENEWABLE INTIATIVES

In the non-renewable category the DOE initiatives principally include efforts to accelerate the development of U.S. supply capability in:

- coal liquefaction,
- exploitation of unconventional gas;
- high-BTU coal gasification;
- use of coal in small industrial plants, including fluidized bed and low BTU gas, through tax incentives.

The budget and tax impacts of the DOE proposals and the OMB recommendations are summarized below:

Non-Renewable Energy Supply Initiatives
($ in millions)

		1979	1980	1981	1982	1983
DOE request	BA:	249	462	239	163	96
Tax Expenditures:		0	0	41	82	93
OMB Recom.	BA:	77	258	156	102	-37
Tax Expenditures:		0	0	11	22	33

DOE proposes to build two solvent refined (SRC) coal plants beginning in FY 1979 in order to help meet in a timely manner both our fuel liquids and solids requirements. OMB notes:

- The total cost of both plants would be about $1.1 B for demonstrations for two technologies which share about 80% of their components in common.
- You decided to provide funds for only one plant in the FY 1979 budget.
- The design phase should be undertaken on a competitive basis during FY 1979.

Should a decision be made on the basis of the information developed during the competition that two demonstration projects should be undertaken an FY 1979 supplemental can be proposed at least at two later dates. Therefore, OMB recommends that at this time funds continue to be provided for only one plant in the FY 1979 budget. (Issue Paper at Tab A1.)

OMB supports the DOE initiatives which would encourage the development of high-BTU coal gasification. These initiatives include DOE intervention before the Federal Energy Regulatory Commission for equitable rate treatment including "rolled-in" pricing and an "all-events" tariff which requires that the rate payers assume all costs in the rare event that a plant cannot come on line. In addition, the initiative includes an appropriation request ($30 M BA in FY 1979) for loan guarantees in case the regulatory approach fails.

OMB agrees that both approaches should be pursued to "hedge our bets" in efforts to get at least one commercial scale coal gasification plant on line by 1985. CEQ supports the tariff relief for a coal gasification plant but opposes providing budget authority for loan guarantees and "rolled in" pricing.

OMB supports increased funding for the development of nonconventional gas supplies, but not at the levels proposed by DOE. (Issue Papers at Tab A2.)

OMB believes that the Administration's current position on tax incentives for advanced coal technologies in small industrial plants is commensurate with their potential contribution to meeting NEP goals. Therefore, OMB disagrees with DOE's proposal to increase these tax incentives and feels that such an Administration action may weaken our position in dealing on the NEA tax conference. In addition, OMB disagrees with the need for early announcement of an oil shale buy program. (Issue Paper at Tab A3.)

TAB A-1

Solvent Refined Coal

Background

The Department of Energy is proposing to build two solvent refined coal (SRC) demonstration plants:

- an SRC I solids plant to convert sulfurous coal to a relatively clean burning solid fuel;
- an SRC II liquids plant to convert solid coal to a liquid boiler fuel.

The total Federal cost of the two plants would be approximately $1 to $1.2 billion.

The FY 1979 budget now includes $23 million for the initiation of one SRC demonstration plant, with a total estimated cost of $500 to $700 million. Your decision to include funds for this plant in the FY 1979 budget was based on an understanding that DOE would study two alternative solvent refined coal processes, and subsequently choose the more attractive process, from the standpoint of economics, capability to meet environmental standards, technical risk and product marketability. Because the SRC I and SRC II processes are basically similar, with some 80% of the unit operations being identical, the successful demonstration of either SRC I or SRC II would greatly enhance industry's capability to scale up either of the SRC processes to commercial size.

In order to build two SRC plants, DOE is planning to sign sole source contracts with Gulf Oil Corp. for the SRC II plant and Southern Company Services, Inc. for the SRC I plant. These contracts would be supported by FY 1978 reprogrammed funds ($12 million) and would commit the Government to a four phase procurement with an option to terminate the contract at each phase. The first phase is for demonstration plant design and proposal preparation with detailed design, construction and operation of the demonstration plant in the subsequent phases.

OMB recommends that an additional $20 million of reprogrammed funds be provided for the first phase of the program in order to allow other bona fide coal liquefaction groups (two companies at present) to undertake design studies. This could allow for greater competition for the subsequent Government contract to proceed with the construction of one or two coal liquefaction demonstration plants.

Issue: Should the Administration provide funds for the construction of two SRC demonstration plants in FY 1979?

Alternatives

Alternative 1: Provide $37 million additional funding in FY 1979 to accelerate the construction of one coal liquefaction demonstration plant selected, early in FY 1979, from the design competition funded in FY 1978. Reserve judgment on committing to any additional coal liquefaction demonstration plants until they are justified by data obtained from the ongoing DOE coal liquefaction pilot program. (OMB)

Alternative 2: Provide $192 million additional funding in FY 1979 for the construction of two SRC demonstration plants based on the FY 1978 sole source contracts with Gulf Oil Corp. and Southern Company Services, Inc. (DOE)

	1978	1979	1980	1981	1982	1983
Current SRC Plant Program	0	23	125	200	150	50
Alternative 1 (OMB)	32	60	125	200	150	13
Alternative 2 (DOE)	12	215	281	275	211	146

Discussion

OMB and DOE agree that it is reasonable to accelerate the construction of the demonstration plant.

DOE highlights the importance of building both an SRC I and an SRC II plant, not only to prove the processes (which DOE agrees are very similar) but also to produce both clean solid and liquid fuels for demonstration use. In addition, DOE states that there is no reason to broaden the competition for the first demonstration plant because only two groups are ready to proceed with their processes to the demonstration plant scale.

OMB contends that there is little to be gained by committing now to two SRC plants, a solids plant and a liquids plant, because the processes are basically similar and therefore, knowledge learned from one process is transferable to the other process. Furthermore, DOE should wait to initiate funding of a second coal liquefaction demonstration plant until it has additional information from ongoing pilot efforts. The other processes now in the pilot stage may prove to be more economic or more technically sound than those which would now appear ready for demonstration.

While DOE may be correct in its assessment that only two groups are ready to proceed with coal liquefaction demonstration plants, OMB contends that other coal liquefaction groups may well be able to meet a coal liquefaction demonstration plant objective of being online in the 1982-83 timeframe and, therefore, should be encouraged (through support of design studies) to compete for the Government contract to proceed with demonstration plant construction. OMB feels strongly that the Administration will benefit from an open competition for these large contracts, rather than being left in a position where companies who believe they are ready to proceed to a demonstration plant are foreclosed from the process.

Decision

Alternative 1 (OMB, CEQ) One Coal Liquefaction Demonstration Plant ☐

Alternative 2 (DOE) Two SRC Demonstration Plants ☐

Energy Supply Initiative: Unconventional Natural Gas

Background:

Four sources of unconventional natural gas have the potential for providing additional gas by the late 1980's. They include: (1) geopressurized methane, (2) gas from tight sands, (3) Devonian shale gas, and (4) coal bed methane. Geopressurized gas has not been produced commercially because of technological and environmental uncertainties, and unfavorable economics. In addition, major unresolved questions remain with respect to the extent of the recoverable resource base. Gas from tight sands and Devonian shale has been produced commercially for many years, but only from the highest quality portion of the resource base. Ultimate recovery could be greatly enhanced by timely and widely adopted improvements in completion and fracturing techniques. Finally, three separate inducements for production of coal bed methane are required: removal of institutional barriers, improved technology for drilling and fracturing for removal of methane prior to mining, and the establishment of a market for low and medium BTU gas that could be recovered as mining occurs.

Issue: What is an appropriate increase in funding for unconventional natural gas research, development and demonstration? ($40M is currently provided in the President's FY 1979 Budget.)

Alternatives

Alternative 1: Provide an additional $10 million in FY 1979. Make no additional commitments for these programs until they are managed better and more substantive research objectives are stated. (OMB)

Alternative 2: Provide an additional $25 million in FY 1979. (DOE)

	Budget Authority ($ Million)				
	FY 1979	FY 1980	FY 1981	FY 1982	FY 1983
Alternative 1 (OMB)	10	10	10	0	0
Alternative 2 (DOE)	25	58	18	0	0

Discussion

OMB and DOE agree that the unconventional natural gas resource represents a significant energy potential which will be tapped only with additional research and development.

DOE argues that a large increase in funds for these areas now will result in important hardware development and fracturing techniques as well as important statistical evidence for geopressurized methane.

OMB recommends only $10 million of the requested $25 million because DOE has failed to explain how the additional funds will in any way effect our ultimate ability to exploit the unconventional natural gas resource.

Decision

Alternative 1 Provide $10 million (OMB) ☐

Alternative 2 Provide $25 million (DOE) ☐

Energy Supply Initiatives: Tax Proposal Issue

Background

The Department of Energy is proposing two tax incentives for fossil fuels in its energy initiatives package. The proposals are:

- Limit the oil shale tax credit proposed by Senator Talmadge in the NEA tax conference by providing a $3.00 per barrel tax credit for the first 10,000 barrels of shale oil produced by a shale oil production company. This credit would be applicable only to plants constructed before 1987 and would be effective for 20 years or the life of the plant. Methods to curtail further the tax credit if it is no longer required due to increases in oil prices are under examination.

- Provide a 5-year depreciation for advanced industrial scale coal technologies including atmospheric fluidized bed combustors, and low and medium BTU coal gasifiers in addition to the tax credits proposed in the NEA tax conference (20-25 percent). This additional tax credit would be phased out by 1986.

Two issues arise from the DOE tax incentive initiatives:

1. Should the Administration support a limited tax credit; is this incentive sufficient to encourage accelerated oil shale development?

2. Should the Administration support additional tax incentives for advanced industrial coal technologies?

1. Oil Shale

Issue: Should the Administration support a limited oil shale tax credit; is this incentive sufficient to encourage private sector development of the oil shale resource?

Alternatives

Alternative 1: In addition to the allowance already in the NEP for oil shale to be sold at the world oil price, provide a $3.00 tax credit for the first 10,000 barrels of daily production per producer for plants constructed before 1987. (OMB)

Alternative 2: In addition to Alternative 1, announce that the Administration is considering a guaranteed oil shale market by having DOE or DOD purchase an unspecified amount of the output from oil shale plants. (DOE)

Discussion

OMB and DOE agree that the Administration should support a limited oil shale tax incentive (This would be a retreat from the Administration's former position of opposing the unlimited $3.00 per barrel oil shale tax credit proposed by Senator Talmadge).

The limited nature of the tax credit will enable producers to build less than full scale plants without undue financial risks. The scale of operations supported by the limited tax credit will allow for a learning period so that technical problems may be overcome and environmental risks dealt with before they become environmental disasters.

DOE contends that the Administration should announce that it is considering the guaranteed purchase of shale oil produced by the pioneer plants in addition to providing the limited tax credit in order to assure the development of an oil shale industry. DOE has not provided an analysis of the expected cost to the Government of the combined tax incentive-guaranteed market approach.

OMB contends that Alternative 1 provides industry with a sufficient financial incentive to initiate their pioneer efforts and at least one company (Union Oil) has indicated that it will move forward with construction of an oil shale plant based on the limited tax credit. OMB further believes that the Administration should reserve judgment on providing a guaranteed market until the effects of the limited tax incentive are fully understood. OMB estimates that ultimately five plants may be built as a result of the limited tax incentive with annual tax revenue losses of $55 million and total tax revenue losses between FY 78-85 equaling $154 million.

CEQ is opposed to any oil shale initiatives.

Decision

Alternative 1: Limited tax credit for oil shale ☐

Alternative 2: (Alternative 1 plus guaranteed oil shale market.) ☐

2. Advanced Coal Technology

Issue: Should the Administration support additional tax incentives for advanced industrial coal technologies?

Alternatives

Alternative 1: Provide no additional tax benefits for low and medium BTU coal gasifiers or industrial scale atmospheric fluidized bed boilers beyond the 10 percent additional tax credit provided in the NEA tax conference. (OMB)

Alternative 2: Provide a 5-year depreciation period for low and medium BTU gasifiers and atmospheric fluidized bed combustors in addition to the tax credit provided in the NEA tax conference. This additional tax incentive would terminate in 1986.

Incentive	1978-1983 Revenue Loss $ Million	Barrels/Day Oil Saved
Incremental Costs and Benefits of DOE proposed initiative	$263	35,000

Discussion

Alternative 1 provides a 20 percent nonrefundable tax credit for advanced coal technologies and is the Administration's current position on the NEA. The NEA tax conference is split on this issue with the House favoring the Administration position and the Senate favoring a far more expensive 25 percent refundable tax credit for these technologies.

DOE contends that the additional tax incentive will enhance the competitive position of these technologies in the market thereby accelerating their introduction. DOE estimates that the additional tax incentive would reduce the average user's cost for advanced coal technology by 3 to 5 percent. DOE indicates that this incentive should be viewed as a means of demonstrating technology rather than displacing large quantities of oil.

OMB believes that the Administration position provides the advanced coal technologies with an incentive commensurate with the technical risk associated with their implementation and in combination with the advanced coal technology projects supported in the DOE base program provides sufficient demonstrations to prove industry's capability to use these technologies. The DOE FY 1979 budget already includes approximately $38 million for demonstrations of these technologies.

OMB feels that it is premature to provide additional incentives that would accelerate coal use in the industrial sector until the economic and environmental implications are better understood. A joint DOE/EPA/OMB industrial coal use study has been initiated recently to address these

issues as well as the development of appropriate incentives to induce increased coal use. OMB believes that initiatives in this area should be deferred until completion of the study. Results from that study are planned to be inputted into the development of NEP II in 1979.

If you should decide to provide additional tax credits for these technologies you will have to decide whether to use this added tax incentive as a part of the DOE initiative package or as an Administration compromise position with the NEA tax conference. If you choose to use this as a compromise position then it should be closely held within the Administration rather than offered now as a DOE initiative.

Decision

Alternative 1 Maintain Administration Position (OMB, CEQ) ☐

Alternative 2 Provide additional incentives (DOE) ☐

- Use this tax incentive as a NEA fall back. ☐
- Announce this tax incentive with the supply initiatives. ☐

TAB B

Introduction to Renewable Initiatives

The DOE reneable energy supply initiatives would:

- triple funding for advanced photovoltaic research;
- increase funding for wind development and demonstrations by 50%;
- expand biomass R&D by 1/3;
- begin new assistance program for small hydroelectric site studies and increase small hydroelectric technology development;
- expand small scale technology grant programs tenfold by 1980;
- increase in solar training activity; and
- initiate an awards program for "passive solar" designs.

In addition, the CEQ solar initiatives, for announcement on Sun Day, May 3, would:

- accelerate the use of more costly renewable technologies and conservation steps in Federal buildings;
- triple funding for DOE international energy R&D activities;
- provide direct funding for regional solar energy centers; and
- initiate a program to build a model solar farm in each state.

OMB believes that the replacement cost pricing proposal could initially cost as much as $1.5 billion in Federal outlays between now and 1990.

The budget impacts of the DOE and CEQ proposals and the OMB recommendations are summarized below.

		Renewable Energy Initiatives (Budget Authority - $ in millions)				
		1979	1980	1981	1982	1983
DOE and CEQ requests	BA	130	197	209	261	267
DOE request	BA	100	132	114	136	112
OMB Recom.	BA	25	25	25	25	25

DOE and CEQ believe that the $500 million in outlays and tax credits in the 1979 budget for solar programs (a 25% increase over FY 1978) is inadequate to demonstrate the Administration's commitment to solar and other renewable supply options. DOE and CEQ argue that large Congressional add-ons are likely--and will take the initiative away from the Administration unless a significant package of new solar activities is now proposed to the Congress.

OMB believes that critics of the budget have failed to note the very significant increases in the President's FY 1979 budget resulting from the combination of R&D and the NEP solar tax credits. In view of the very rapid growth of the solar program funds, the current state of the technology, and the additional resources made available by the decline in heating and cooling demonstrations, OMB argues that the current level

of Federal R&D represents a strong and reasonable commitment to solar energy development. Therefore, the scope of the DOE and CEQ proposed initiatives would be inappropriate and premature.

However, OMB recognizes--and our recommendations reflect--that some increases may be warranted principally for (1) areas that are already featured in your solar budget and have demonstrated as a result of recent progress that there remain attractive opportunities for further funding at this time (e.g. photovoltaics, biomass); and (2) areas where recent evidence indicates a small amount of additional support would be helpful in meeting the objectives of the NEP (e.g., solar training, passive solar design prizes).

DOE Renewable Energy Supply Initiatives

Background:

The Department of Energy has proposed a variety of renewable initiatives primarily for more work on solar heating and cooling, photovoltaics, wind energy, fuels from biomass, and low head hydro electric power.

Alternatives:

1. Provide for a limited program of additional initiatives which spotlight and enhance your FY 1979 budget for small scale renewable energy sources, but do not allow for activities which would result in sharp departures from the policies and decisions on which your FY 1979 budget was based, or any activity that may be inappropriate, premature or result in very large out year mortgages. (OMB recommendation).

2. Provide a larger, more visible, and comprehensive package of additions to your FY 1979 budget, recognizing the strong desire on the part of some elements of the public and the Congress for a much larger direct outlay program for renewable energy sources and the possibility that large Congressional add-ons will be appropriated in any event for this purpose. (DOE recommendation).

Cost of Alternatives:

	Additional Funding (Budget Authority $ in millions)				
	FY 1978	FY 1979	FY 1980	FY 1981	FY 1982
Alternative 1 (OMB Recom.)	0	25	25	25	25
Alternative 2 (DOE supply)	0	100	132	114	112

Discussion:

Alternative 1 calls for six initiatives:

- Increase advanced photovoltaics R&D by 67%.
- Increase biomass conversion R&D in DOE by 20%.
- Increase funding for solar agricultural activities in USDA.
- Increase by 67% small grants for innovative applications of low scale technologies.
- Initiate a new program for passive solar design prizes.
- More than double Federal efforts on solar training.

These OMB recommendations are in areas of solar R&D that are among the most promising or most representative of small scale technology development, with funding at a level and in a manner which recognizes the need for continuing fiscal restraint, protects the integrity of the President's solar budget, and avoids premature commitments to potentially costly subsidy programs. For example, this alternative would include more

research on novel materials and designs for photovoltaics, efforts to develop new technologies to convert wood to fuel products resembling gasoline, and design prizes to stimulate innovative design concepts for the use of passive solar in buildings. This alternative would not allow large scale subsidized procurements for wind machines, a hardware oriented program to assist LDC's, subsidies for low head hydro electric equipment and resource development, or additional energy conservation initiatives.

OMB believes that while these limited additions could enhance the strong and comprehensive solar programs proposed in the FY 1979 budget, that the further additions proposed by CEQ and DOE would undermine the strategy on which your FY 1979 budget was based and lead to unnecessary and costly commitments in later years. Your base solar program for FY 1979 proposes tax credits to encourage heating and cooling technology already on the market, ($100 million in FY 1979) but favors the relatively less costly research on other solar technologies to reduce the cost and improve the reliability of these technologies before further subsidies on large scale demonstrations of potentially uneconomic technology are undertaken.

OMB believes that the further add-ons proposed by DOE, above the OMB recommendation, would be inconsistent with this policy and undermine both the integrity of the President's budget and the resolve of the appropriations committees to hold the line on Congressional add-ons. OMB further argues that, while the proposed options are not costly in FY 1979 relative to the non-renewable initiatives, they will lead to large commitments to subsidized purchases of potentially uneconomic technology, but are not likely to result in any significant energy supply capability by 1990.

Alternative 2 proposes a larger program covering all major renewable energy resources and expanded grant activities to support the demonstration and use of small scale decentralized technologies by individual small businesses and communities. This alternative would be highly visible and appeal to both public solar advocates and members of Congress who might otherwise support renewable energy add-ons to the President's budget. This option would provide further increases for the activities recommended in Alternative 1, but also would go further to include renewable energy and conservation options such as large scale wind energy demonstrations, Federal assistance for feasibility studies at potential low head hydro electric sites and development of standardized hydro electric generating equipment, the development and commercialization of improved residential oil burners and a new program to demonstrate existing renewable energy resource technologies (e.g., heating and cooling, anerobic digestion, waste heat recovery).

DOE argues that the proposed initiatives will provide needed visibility and support to stimulate greater near-term use of a range of renewable energy technologies and provide a convincing demonstration of Administration commitment.

Decision

Alternative 1 (OMB) Renewable initiatives funded at $25M in FY 1979

Alternative 2 (DOE) Renewable initiatives funded at $100M in FY 1979
(CEQ also supports this alternative)

CEQ Sun Day Initiatives

Background:

In addition to the DOE "eight week" supply initiatives, CEQ is proposing separately for announcement on Sun Day solar initiatives covering international cooperative programs in solar development, agricultural applications of solar energy, direct funding for solar energy centers, and the application of marginal cost pricing assumptions for conservation and renewable energy investments in Federal buildings. Not included here are initiatives with essentially no budget impact that were referred to in the memo on Sun Day sent to you earlier from Stu Eizenstat (i.e., announcement of solar domestic policy review, use of solar in the White House, and an international conference on renewable energy).

Alternatives:

Alternative 1: Conduct a study of the costs and benefits of applying replacement cost pricing assumptions to possible renewable energy and conservation measures for Federal buildings. Do not allow for expansion of hardware oriented R&D programs to assist lesser developed countries, direct funding for regional solar energy centers, additional funding for model solar farms in USDA, or immediate implementation of replacement cost pricing for energy related investments in Federal buildings. (OMB recommendation)

Alternative 2: Provide funding for substantially broadening the scope of Federal solar and renewable energy activities by providing model solar farms in each state in the Department of Agriculture, by increasing the scope and funding for a cooperative program to assist lesser developed countries in developing and applying renewable energy technologies, by providing separately identified and highly visible funds for regional solar energy centers, and by mandating the use of replacement cost pricing now for Federal buildings investments to encourage the use of renewable energy technologies. (CEQ recommendation)

Cost of Alternatives:

	Additional Funding (Budget Authority-$ in millions)				
	FY 1978	FY 1979	FY 1980	FY 1981	FY 1982
Alternative 1 (OMB Recom.)	0	0	0	0	0
Alternative 2 (CEQ Add-ons)	0	30	65	75	125

Discussion:

Alternative 1 would not support the initiatives recommended by CEQ:

- An international program of renewable energy R&D. (No new program until an evaluation of the existing activities is completed and all new international energy activities are considered together in the FY 1980 budget review.)

- Direct funding for regional solar centers. (No direct funding for solar centers. Require that the centers compete for funds from established solar programs in the same manner as the national solar energy research institute and other DOE laboratories.)

- Marginal cost pricing for Federal building investment. (Study the cost and benefits of this proposal and the best method of implementation, but do not commit now to the application of marginal pricing assumptions for all renewable energy and conservation technology investment proposals for Federal buildings.)

OMB believes that the proposals for an international R&D program model solar farms in each state and marginal cost pricing are premature, and that the proposed direct funding for regional solar centers is highly inappropriate.

Alternative 2 provides for:

- The activities included in Alternative #1 plus demonstration solar farms in each state.

- An initial commitment to a strong U.S. program to assist in the deployment of solar technologies in developing countries. Directly help these countries meet their energy, food, and development needs by developing small scale renewable energy technology to meet those needs.

- A highly visible commitment to independent regional solar activities oriented towards demonstrating applications of existing renewable energy technologies.

- Implementation of cost assumptions which will result in funding for additional conservation and renewable resources measures in Federal buildings which are not now cost effective on an average cost basis but which may be cost effective on a replacement cost basis.

CEQ believes that these measures, in the amounts recommended, would be important additions that would further signal to Congress and the Public the Administration's strong visible commitment to develop renewable energy resources.

Decision

Alternative 1 (OMB) No funding for additional renewable initiatives. ☐

Alternative 2 (CEQ) $30M in FY 79 for additional renewable initiatives. ☐

DoE BUDGET
APPEAL
(Summary
& Full
Version)

Department of Energy
Washington, D.C. 20585

MEMORANDUM FOR: THE PRESIDENT

FROM: JIM SCHLESINGER

SUBJECT: DOE Energy Supply Initiatives

The major energy policy decisions made by this Administration to date are seen by many in the Congress and the public as paying insufficient attention to the problem of future energy supply, both in the traditional areas -- oil, gas and coal -- and the "soft path" areas -- solar, wind, biomass fuels and the like. We have proposed a series of supply initiatives in these areas, most of them in the form of an FY 1979 budget amendment. The purpose of this memo is briefly to present our view of the importance of these initiatives and the uniqueness of the strategic opportunity which presents itself.

The DOE Proposals

The initiatives we have suggested cover increased production from coal liquifaction, fluidized bed combustion, high and low Btu coal gasification, unconventional gas sources, and a series of renewable energy technologies. Our proposals are designed to develop a wide range of technologies for possible deployment if world oil prices rise substantially.

Continually rising oil demand in the face of limited production capacity is at the heart of the energy problem. Worldwide oil consumption growth, coupled with foreseeable limits to production by oil exporting countries, lead to the conclusion that oil will become more scarce and expensive during the 1980's.

The economic and national security consequences of rising dependence on increasingly expensive and unreliable foreign oil are amply evident today; they include the slowed economic growth and inflation that occurred after the OPEC embargo and continued high prices. In a future environment

of scarce and expensive oil, the U.S. can maintain its patterns of economic expansion only by reducing imports and by initiating now the inevitable shift away from petroleum. Conservation programs will be of significant assistance; but in the final analysis, more supply, either of equivalent liquid fuels, gas, or renewables which can readily substitute for petroleum, will be necessary.

For each of these supply areas, a range of new sources and technologies could become commercially attractive during the 1980's. In their current state of technical advance, most of these new sources are not economically attractive to private interests at today's oil prices, but will be economically attractive at the oil prices which are likely to accompany a worldwide oil capacity limitation. In varying degrees, all require extensive lead time -- for technical advances and for institutional adjustments to be made -- to render them, first, capable of widespread commercialization and, then, to build sufficient capacity to make a meaningful contribution to supply. The initiatives we have proposed focus only on improving or accelerating our capability to deploy these technologies. It may be necessary in the future to propose additional measures to induce major capacity additions. We are conducting a major follow-on study to determine what further steps will be necesary.

In addition to the supply initiatives recommended, there are two initiatives already forwarded to you that relate to the supply development effort. These are:

- Impact assistance: Grants to States and loan guarantees to assist communities in adjusting to energy development.

- State Energy Management and Planning Act: A grant consolidation effort to simplify three existing conservation programs and provide states additional capability to plan for and manage the entire spectrum of supply and conservation activities.

If you decide favorably upon these two initiatives before your Western trip, we would propose combining them with the supply initiatives. By doing so, we can emphasize how important it is to strengthen State and Local capabilities to plan and support energy development.

The following table sets forth our FY 1979 budget recommendations on the 1978 supply initiatives, the OMB mark, our appeal and the new total.

	DOE Supply Initiatives	OMB Mark	Appeal	Total With Appeal
SRC Demonstration Plants	$192	$37	$155	$192
Oil Shale	0[1/]	0[1/]	0[1/]	0[1/]
Unconventional Gas .	27	10	17	27
High Btu Gas Loan Guarantees	30 → 20	0	30	30
Direct Coal Use	0[2/]	0[2/]	0[2/]	0[2/]
Renewable Resources	117	25	75	100
	$366	$72	$277	$349

1/ No current budget issues.

2/ Tax credit.

A discussion of the proposals and their rationale follows:

SRC Demonstration Plants

One of the most promising routes to dealing with potential future scarcity of domestic liquid fuels is through the development of a domestic commercial capability to produce synthetic fuels from coal. Development of these technologies now would allow actual production of commercial volumes of clean synthetic fuels in the late 1980's.

To that end, we have proposed an initiative of $192 million to demonstrate at an accelerated pace the most mature synthetic coal technology -- the solvent refined coal (SRC) process -- through the construction of two demonstration plants. The SRC I process is being developed by a consortium headed by Southern Company Services and includes three other firms. SRC II is being developed by Gulf Oil Company.

The SRC process is capable of producing either a clean burning, low sulfur solid fuel or a synthetic liquid boiler fuel. The liquid and solid processes are targeted at different markets. The solid product will serve as a direct replacement for high sulfur coal burned in utility power plants, which make up 50 percent of the total U.S. electric generating capacity. The liquid product will directly replace fuel oil, which is burned in approximately 20 percent of the Nation's utility power plants, as well as provide other products. With further upgrading, the liquid product can also be used as a synthetic crude feedstock for refinery conversion to conventional fuels.

OMB agrees that the development of synthetic fuels should be accelerated. However, it favors a design competition among all major liquefaction process proponents and the construction of only one demonstration facility.

Because a design competition could result in as much as two years' delay in the program, we continue to recommend initiation of sole source design contracts with the contractors currently familiar with the SRC technology. We also recommend that we keep open the option of moving ahead with two demonstration facilities, one solid and one liquid plant. Consideration of Federal support for other direct liquefaction processes can be considered when they demonstrate the level of readiness to proceed that the SRC processes have reached.

Oil Shale

The Department has recommended a three part program to stimulate the development of demonstration oil shale plants:

- o Entitlements treatment for oil shale similar to imported oil.

- o A limited $3.00 per barrel tax credit for the first 10,000 barrels a day production from oil shale, and

- o Pursue the desirability of a Federal buy of the production from one or more oil shale plants, through either DOE or DOD.

OMB supports the entitlements change and the limited $3.00 per barrel tax credit, but does not want DOE to mention the possibility of either a DOD or DOE buy.

We are concerned that without the potential of a Government buy, DOE would not have an answer to the argument that some companies would not be able to use the tax credit. For example, one consortium interested in oil shale development does not have a tax base to take advantage of the tax credit. By leaving open the option to buy, the Administration could creditably say that incentives would be available for a wide range of possible oil shale projects. This would give us a stronger position to limit the tax credit to demonstration plants and to defeat legislation for Government-owned contractor operated oil shale plants.

Unconventional Gas and High-Btu Gas Loan Guarantees

Two initiatives would contribute toward keeping the gas pipeline, distribution and end-use system efficiently utilized:

-- expanded technology demonstration programs to stimulate earlier and more extensive production of unconventional natural gas from geopressurized zones, tight gas sands, coal seams and Devonian shale ($27 million).

-- accelerated construction of several commercial-scale, high-Btu coal gasification facilities achieved through regulatory changes and loan guarantees ($30 million for a default fund).

Currently, the U.S. has a major capital investment in the facilities for transportation, distribution and use of natural gas. Gas is generally cheaper than electricity for end-use applications and creates fewer enviromental problems than other fossil fuels. Keeping this national asset fully productive is a key supply concern.

OMB provided only $10 million of our $27 million initiative in unconventional gas. The $17 million difference is a small amount considering the large potential for unconventional gas. It is important to move ahead now so that this resource will be available to the country as soon as possible, particularly in light of the pressures for other high cost gas sources, such as LNG. We are convinced that industry will not move ahead on its own because of other, less risky opportunities for use of their capital. We plan to work closely with the industry in structuring a meaningful program and will seek its assistance at the next meeting of the National Petroleum Council.

We requested $30 million as a reserve for losses for high-Btu coal gasification loan guarantees. OMB argues that DOE should fully examine and pursue the regulatory route prior to seeking authorization for loan guarantees. The OMB mark does not indicate an unwillingness to use loan guarantees in this area, but indicates that regulatory treatment is the preferred route. There is no budget outlay issue here since no outlays are likely; it is purely a matter of strategy. As a matter of strategy, we believe failure to request funds will be interpreted as backing away from a commitment to pursue an aggressive program to bring high-BTU gas on line.

Direct Coal Use

In order to increase the utilization of plentiful domestic coal reserves, an initiative is proposed to use coal in direct applications. We recommend a temporary tax subsidy for advanced coal technologies: atmospheric fluidized bed combustion and low- and medium-Btu coal gasification.

The National Energy Plan stressed direct-burning of coal through conventional technologies. Further progress in substituting coal for utilities and industry requires accelerated use of advanced technologies which directly burn coal more cleanly or which cleanly convert coal to gas at or near major fuel burning installations.

OMB disagrees with this initiative. Our rationale for the initiative is:

- o The tax credit costs only $260 million between now and 1985 and yet doubles commercializaton of these technologies.

- o The Administration is in a better position before the tax energy conference if it argues that it has reviewed the range of supply initiatives and only believes tax credits are applicable in two cases. Heretofore, the Senate Finance Committee has argued that the Administration has not been interested in supply and, therefore, Congress needed to take the initiative. We believe the credibility of having a supply program will strengthen our hand in reducing other tax credits.

Renewable Resources

A package of individual initiatives are proposed to accelerate commercialization of renewable technologies which can pay off in the near term. The package consists of:

- -- increased research on photovoltaic solar energy;

- -- commercial demonstrations of wind machines;

- -- production of gas and liquid fuels from biomass;

- -- prepackaged small hydropower plants, demonstration of low-head hydro systems, and feasibility studies for hydropower at existing dams;

- -- small-scale technology grants;

- -- a decentralized technology demonstration program;

-- design awards for passive solar heating and cooling; and

-- solar training and education programs.

-- oil burner retrofit commercialization.

We initially proposed $117 million for this set of initiatives; the OMB recommendation was $25 million. We feel strongly that anything less than $100 million will be embarrassing politically and will have no impact on moving the Congress in more productive directions.

The Council on Environmental Quality has suggested several additional solar initiatives, which we also believe deserve consideration. In particular, we support a CEQ initiative to require Federal agencies to consider the marginal costs of alternative energy supplies in determining whether to use solar energy. We believe any extra costs attached to this approach can be dealt with by stretching out the implementation of the program.

The interest in renewable energy sources is substantial. The Solar Coalition, a group of seventy Senators and Representatives, has introduced a number of pieces of solar legislation, some of it extraordinarily costly ($5 billion for a Solar Development Bank, $96 million for solar energy in agriculture). Solar energy advocates have strong support and are likely to attract more. Various states, especially California, are also pushing ahead rapidly on substantial solar initiatives of their own.

The leaders of the Sun Day effort and critics of the Administration's solar effort have pointed out the $17 million "decrease" in the FY 1979 budget for solar activities. The OMB mark would only restore $15 million of this decrease. Our repeated suggestion that any honest accounting of Government policy would include the $1 billion worth of tax credits over the next seven years authorized by the National Energy Act has not overcome the impression that our commitment to solar energy is lagging.

WHY ACT NOW?

Energy has clearly been an area of demonstrated Presidential leadership over the past fourteen months. Your policies

on conservation, coal conversion and production incentives embodied in the National Energy Plan and, more recently, on nuclear energy issues, have shifted energy priorities and moved the Nation in essential new directions.

We are now at another critical policy juncture, and again difficult choices must be made. Our ability to impact Congressional action on the energy budget and thus on our energy supply priorities, is at stake.

The House authorizing committees, Science and Technology and the Energy and Power Subcommittee of Interstate and Foreign Commerce, have added substantial sums to our FY 1979 budget. Because of the timing of the creation of the Department of Energy in relation to the FY 1979 budget cycle, the 1979 budget reflects only a beginning effort toward a reorientation in priorities from those of previous budgets.

Many of the additions made by these committees are for activities to which we would not assign a high priority (mandatory purchase of photovoltaic solar systems) or which we specifically oppose (Clinch River). The House Science and Technology Committee has added $183 million for solar and renewables and $233 million for the breeder reactor ($575 million in total). The Commerce Committee, with a more limited jurisdiction, has added $65 million to our budget as well.

Energy supply clearly has a very high priority in the Congress. If OMB continues to treat energy programs under the same budgetary guidelines as all Federal programs, we will continue to face large Congressional increases. These inevitable increases will make the job of sustaining a Presidential budget more difficult.

Although we understand the need to hold down Government expenditures as part of the fight against inflation, I am convinced that these initiatives will not lead to an overall increase in the budget. Rather, it will lead to a distribution of expenditures consistent with Administration priorities. The $72 million ($25 million for renewable technologies) recommended by OMB is so much lower than the levels being considered by the Congress that we would recommend no initiatives be sent forth unless there were substantial increases to that number.

A series of positive Administration initiatives would have the following advantages:

- The Administration would be able to set forth its priorities compared to merely accepting Congressional add-ons.

- The initiatives would counteract the strongly-held feeling in the Congress that this Administration has been weak on pursuing energy supply.

- The initiatives would provide you with a strong posture for Sun Day and for the subsequent debate over solar and renewable energy.

I strongly recommend you approve the initiatives as proposed.

Department of Energy
Washington, D.C. 20585

April 29, 1978

MEMORANDUM TO: THE PRESIDENT

FROM: JIM SCHLESINGER

SUBJECT: 1978 Supply Initiatives

Attached is our memorandum appealing the tentative OMB mark on the 1978 supply initiatives.

In addressing the immediate problem of curbing oil imports, the National Energy Plan also foretold the need for a series of Phase II initiatives directed at increasing domestic energy supply. Work has gone forward on this package in the hope that Phase I could be completed before Phase II was submitted for Congressional review. Now, because of the Congressional interest in supply initiatives, the lateness of the hour in the Congressional budget cycle, and the length of time involved in completing Phase I, that does not appear possible.

Those who have supported the Administration's energy program, even including Senator Jackson, have repeatedly indicated that it is essential to develop a plan that will ensure that new sources of supply actually come on line when they are needed. In response to this Congressional concern, we have been indicating to the Congress for some time now that a Phase II supply initiative program was being prepared. This Congressional preoccupation with supply has manifested itself in the Congressional budget processes where, for example, the House Science and Technology Committee has already added almost $600 million to our FY 1979 budget. Those additions include large sums for activities to which we would not assign a high priority (large mandatory photovoltaic purchases) as well as some activities we outright oppose (Clinch River).

This package of supply initiatives -- directed at increasing energy production from coal liquefaction, fluidized bed combustion, high, medium and low Btu coal gasification, unconventional gas and a number of politically popular renewable technologies -- is a modest and responsible reply

to Congressional interest and action in this area. In light of this Congressional interest, an incomplete package will be an invitation to further add-ons. The credibility of your commitment to solar and other renewables -- particularly in view of your recent meeting on solar with Congressman Tom Harkin and others -- will likely be determined by the emphasis solar receives in this package.

The critical question is whether the Administration is going to become part of the energy budget process in Congress, using this package of supply initiatives to shape and focus priorities, or whether the Administration is going to become irrelevant to that process. Given the level of Congressional interest and action on supply, we run the risk of becoming irrelevant if our long awaited program is regarded as a trivial, empty gesture. The OMB mark of $72 million for this entire package will be so regarded by many in the Congress. In ordcer to maintain an effective influence on the budget, the credibility of the supply initiatives must be maintained so that the promise of Phase II can be fulfilled.

We are not unmindful of the critical situation facing you in upcoming budgets, and the need to keep Government spending under control. To this end, the Department has undertaken a rigorous review of large outlay programs, many of which were initiated decades ago and have grown without careful and rigorous scrutiny by DOE's predecessor agencies. As part of this review, we have already slipped the schedule on the centrifuge enrichment plant, saving $115 million in FY 1979, $300 million in FY 1980 and $330 million in FY 1981. We believe further significant reductions are possible, and we will be aggressive in our efforts to reduce unnecessary and wasteful programs.

The additional outlays proposed in this package are modest--approximately $150 million in 1979 and $300 million in 1980. I am committed to achieving total expenditure reductions at least equal to these amounts through the review of current DOE programs, as described above. If we do not begin now to develop these new technology capabilities, however, the potential price to the nation's economy during the 1980's could be enormous.

Perhaps more important, if the Administration misses this opportunity to shape the energy supply budget by becoming a credible part of the ongoing Congressional deliberations, the alternative will be to bear the political burden of unresponsiveness, the fiscal burden of unwanted and unneeded expenditures, and a budget process out of control in this area.

I strongly recommend you approve our supply initiative recommendations.

EIZENSTAT
COMMENTS

THE WHITE HOUSE

WASHINGTON

May 1, 1978

MEMORANDUM FOR: THE PRESIDENT

FROM: STU EIZENSTAT
KITTY SCHIRMER

SUBJECT: McIntyre and Schlesinger Memoranda on DOE Energy Supply and Sun Day Initiatives

Summary: This is a very tough call. DOE's initiatives may help us shape and control Congressional action in this area. But, given the budget pressures and the uncertainty of supply initiatives in the COET Conference, I recommend:

- A smaller initiative in the area of $175 to $200 million --- to be taken out of DOE's base in FY 1980.
- If you do not wish to go even this far I would recommend no supply initiative at this time except
- $30 million for solar/renewables.

This solar option does not appear in the OMB memorandum. It would shore up an area where our budget is low and provide the basis for a strong Sun Day announcement in Colorado.

Discussion: Substantial Congressional pressure to increase Federal expenditures on energy supply makes the decision on DOE's FY 1979 initiatives difficult. It is hard to judge whether the DOE increase of $349 million would improve our ability to hold down expenditures, or whether these items would simply be added into the base with little or no restraining effect on the overall energy expenditures. There are, however, very real budget threats in both the tax conference and the regular Congressional authorizations.

Without having had the benefit of specific Congressional consultation on these issues, my recommendations are based on a more general sense of what our posture should be in view of the very serious budget constraints we face.

I. Overall Size of Supply Initiative

I agree with Jim Schlesinger's strong sense that a "supply initiative" in the range which OMB recommends ($72 million

in FY1979) will not be credible. Resisting any add-ons to our original FY1979 budget (with the exception of the solar and renewables area) can be defended on the basis of our overall inflation concerns. It still permits us to review the DOE supply options in the context of the FY1980 budget.

A very small add-on, such as OMB recommends, will not put us in any stronger posture to resist far larger Congressional supply initiatives, and would probably be characterized as a very naive attempt to buy something for nothing.

I believe we are in a far more credible posture with the Congress and the general public if we propose no new non-renewable supply options now but:

- make a strong statement of our commitment to a strong sound supply strategy; and

- express our priorities among the substantial number of supply options which are now pending either in the tax conference or in the authorizing committees.

The conference versions of the NEA and the committee mark-ups of DOE authorization legislation both contain substantial increases over and above the Administration's original recommendation. Many of these proposed expenditures are low priority from an energy supply standpoint. In addition, both the tentative natural gas compromise, and the DOE's tentative bargaining position on increases in producer revenues under COET, increase substantially the resources available to oil and gas producers. These two measures alone make the NEA substantially more supply/production oriented than was our original NEP proposal.

In all likelihood, we will have to accept some of the additional tax credits in order to get COET (particularly oil share, and perhaps some increase in the direct coal use area). It is not clear, however, that announcement of our support for one or another of these proposals (or some compromise) now will improve our overall bargaining position. We believe that these positions should be firmly negotiated in return for support to limit the overall level of expenditures. To this end, we recommend that DOE work with us, OMB, CEA and Treasury to develop a firm, overall negotiating position and strategy for dealing with tax credits and related authorization legislation issues. Given that it is already very late in the authorization cycle, this will have to be done very quickly.

In summary, I think a somewhat more modest initiative -- in the $175 to $200 million range -- could accomplish much of what Jim is trying to do. I would leave it to Dr. Schlesinger's discretion to allocate the $175 to $200 million. I would support this range and think it might help our bargaining position. I think OMB's figure is much too low to be helpful.

If you favor that low a figure, I would suggest breaking out $30 million of it for a solar/renewable initiative and forgetting the rest. If you chose this limited solar option, the rest of Jim's initiatives could be reviewed in the context of the FY 1980 budget -- or as part of a well-thought-through negotiating position on how best to limit our budget exposure in the tax conference and elsewhere.

II. Solar and renewable initiative

A separate case can be made for a small increase in our FY 1979 budget for solar and renewables based on the following:

- our FY 1979 budget for solar R & D (excluding tax credits for commercial application of proven technologies) decreased by $17 million over FY 1978. Although we continue to believe that the tax credits should be counted as part of our overall solar effort, it is difficult to substantively justify a decrease in our R & D efforts on non-proven solar and renewable technologies at the same time that we state that these technologies hold a major promise for future energy supplies.

- several of the increases proposed have substantial technical merit and, unlike loan guarantees for high BTU gas or SRC plants, are not controversial as a matter of R & D policy. OMB has recommended an increase of $25 million in the solar and biomass areas.

- solar and related technologies do not pose major issues in the tax conference and therefore cannot be part of a bargaining or negotiating strategy.

- May 3 is Sun Day, and the credibility of your statement concerning the Administration's commitment in this area, can be substantially enhanced by a relatively small FY 1979 add-on.

- In your meeting with Representatives Harkin, George Brown, Wirth, Ottinger and other liberal members of the House Science and Technology Committee on the breeder compromise, you agreed to review carefully the proposals for strengthening

our solar and renewables effort. In view of the increased expenditures we are tentatively committed to make to reach a CRBR compromise, it is difficult to turn down a small, reasonably well-justified effort in the solar area.

- Finally, this is an area where increased appropreations are a virtual certainty.

DOE has recommended a $100 million increase in the solar and renewable technologies. OMB's recommended add-on is $25 million -- $15 for solar; $10 for biomass. We would recommend a total of $30 million add-on for solar and renewables -- a $5 million increase over the OMB mark to be used for an increase in low head hydro feasibility studies or for appropriate technology small grants. We recommend adding $5 million to the OMB mark principally to remove the charge that our FY1979 solar budget (exclusive of tax credits) is below the FY1978 level of effort. We believe that this additional $5 million can be used effectively in one of several of the solar programs. We would chose low-head hydro or appropriate small technologies largely because of their potential for short-term pay-off.

OSTP
ANALYSIS
& Summary
Chart

THE WHITE HOUSE

WASHINGTON

MEMORANDUM FOR THE PRESIDENT

FROM: Frank Press FP

SUBJECT: DOE Energy Supply and Sun Day Initiatives

The Department of Energy's supply strategy that is now before you is an aggressive program to encourage the development, demonstration and commercialization of fossil fuel and renewable energy technologies. As you examine the initiatives and the comments by OMB and others, there are some general points to keep in mind:

- Over the next 10 to 15 years conventional oil and gas, coal used as coal, nuclear and hydro power will remain by far our most important sources of energy. The response of the private sector to the price and tax provisions that you sign into law will have much greater impact on short-term domestic supply (10 years) than will any program of technological initiatives. Nonetheless, because substantial time is required to develop and commercialize new energy technologies, all your advisers agree that it is important to develop new sources of energy supply. The underlying issues are what sorts of technological insurance should be purchased to protect our energy supply and how much we should pay.

- There are many substantial reasons for not adopting a more aggressive program at this time. Some components of an enlarged program will necessarily be quite expensive and budgets are already strained to the limit. Moreover, the benefits of such a program are affected by substantial uncertainties -- technological uncertainty, uncertainty about the future world market prices of conventional fuels, and in some cases, uncertainty as to whether the new technologies will be environmentally or socially acceptable.

- On the other hand, there are strong arguments for forging ahead. The costs of building a capability to replace conventional fuels may be small compared to the social, strategic, and economic costs of not being prepared if prices rise and supplies become short. Moreover, the political impact at home and abroad of taking an aggressive posture could be significant. The Administration has been criticized for lacking a supply strategy and we believe a substantial increment to existing programs would be well received by the Congress.

On balance, OSTP concludes that many of the DOE proposals warrant favorable action. A more cautions approach is appropriate on others. The OSTP recommendations are indicated on the attached table summarizing the most significant initiatives.

Attachment

Initiative	Analysis	OSTP Recommendation
FOSSIL		
Synthetic Liquids Demonstration		
Issue design contracts for one solid (SRC-I) and one liquid (SCR-II) solvent-refined coal demonstration plant leading to contruction of both plants. (FY 78: +12M; FY 79: +192M; Total: +644M)	The SRC processes are not the technological leaders. SRC-I solids must compete with other processes for clean combustion of coal, and the impact on domestic energy supply is unclear. All coal liquids have unresolved handling and environmental problems. Sole-source contracts are troublesome.	Support a design competition among all bonafide liquifaction processes and accelerate construction of one demonstration plant as recommended by OMB. Another plant could follow later. (FY 78: +32M; FY 79: +37M Total: +32M)
Shale Oil		
$3/b tax credit to first 10,000 b/d Announce possibility of DOD buy (FY 79: 0; Total +110M)	Shale is a large and probably the cheapest source of synthetic liquids. $3 tax credit and world price would be major help to launch the industry. Some small firms may require government buy but holding open this option would delay large firms. Institutional barriers require attention.	Support tax credit. Establish clear criteria concerning qualification for government buy. DOE should commit to working on the institutional impediments. (FY 79: 0; Total +110M) OMB supports tax credit but opposes opening possibility of government buy.
High-BTU Gas from Coal		
Support high-BTU gas plants by . intervening before FERC for non-completion tariff. . providing federal loan guarantees. (FY 79: 30M; Total: +526M)	Issue is what strategy to use. FERC intervention means customers bear risk and would be quicker. Loan guarantees make taxpayers bear risk and would be hedge against failure with FERC. Going both routes together runs some risk of undercutting argument before FERC.	Support initiative. OSTP has no recommendation with respect to strategy. OMB proposes postponing support of loan guarantees until outcome of FERC initiative is known.

Initiative	Analysis	OSTP Recommendation
Unconventional Natural Gas		
Increase level of effort in existing program. (FY 79: +27M; Total: +103M)	These are important potential sources of gas. More resource assessment is needed on geo-pressured resources. Enhanced level of effort on other sources would be useful. Attention is needed to institutional/legal barriers.	Support funding level. Concentrate on institutional/legal issues for coal methane. (FY 79: +27M; Total: +103M) OMB supports at reduced funding level.
Advanced Coal Technologies		
Provide additional tax benefits beyond NEA for fluidized bed combustion, low-BTU gas and medium-BTU gas. (FY 70: 0; Total: +210M)	These technologies are ready for commercial use now. NEA tax incentives will speed market entry. Further incentives would do more but are expensive. Impact of initiative on tax conference must be considered.	This is not a high priority area and could be foregone if lower total cost is desired. Impact on tax conference probably should dominate decision. (FY 79: 0; Total: 0) OMB opposes initiative.

Initiative	Analysis	OSTP Recommendation
RENEWABLES		
Photovoltaics R&D		
Enhance efforts in approaches not emphasized in base program. (FY 79: $30M; Total: $140M)	Greater breadth to the R&D program is needed. Attractive alternative to House S&T commercialization emphasis.	Support DoE initiative. (FY 79; +30M; Total: +140M) OMB supports this initiative at reduced levels.
Wind Energy		
Speed development and commercialization of large-scale machines and install small machines in utility grids. (FY 79: +20M; Total; $210M)	Since not currently economic in most cases, commercialization is premature. Faster development of and operational experience with large machines are needed. Small machines are unlikely to be major supply source.	Accelerate development of large machines. Postpone commercialization decision. Do not increase support for small machines (FY 79: +13M; Total: 20M). OMB opposes this initiative.
Low Head Hydro		
Develop packaged equipment and support feasibility studies and utilization experiments (FY 79: +20M; Total: +80M)	The resource is economic at many sites, and this energy source should be brought on line soon. Increased use encouraged by feasibility studies reduces need for utilization experiments.	Provide increased support for feasibility studies. Support development of packaged equipment. Postpone additional utilization experiments. (FY 79: +15M; Total: +45M). OMB opposes this initiative.
Appropriate Technology Program		
Provide grants to individuals and small businesses to develop concepts into working systems. (FY 79: +5M; Total; 30M)	Although the idea is a good one, pilot program has often supported projects with symbolic or educational benefits rather than technological pay off.	Support initiative only if recast to emphasize innovative approaches. OMB approves this initiative at reduced levels.

Initiatives	Analysis	OSTP Recommendation
Solar Training and Education		
Expand solar training programs and improve availability of skilled personnel. (FY 79: +5M; Total: +8M)	The development of a cadre of trained installers will assist in encouraging use of solar technologies and will protect consumers.	Support the DoE initiative. (FY 79: +5M; Total: +8M). OMB supports this initiative at reduced level.
Residential Oil Burner Replacement		
Increase funding for design and production of efficient oil burners, field testing of prototypes, and promotional and educational activities. (FY 79: 1M; Total: 2M)	The use of more efficient oil burners could result in substantial oil savings. The program is small.	Support the DoE initiative. (FY 79: 1M; Total: 2M)
Dispersed Technologies		
A new program for demonstration of decentralized technologies using renewable energy resources. (FY 79: +5M; Total: +15M)	This program has little technological value, although it may be important politically. The program is small.	A political call. OMB opposes this initiative.
Replacement Cost Pricing		
Require Federal purchase of renewable technologies whenever cost is less than the marginal cost of non-renewable fuels. (FY 79: 0M; Total ?)	The initiative is far-reaching in its effects and implications.	More careful examination and analysis of the initiative is needed. Postpone decision. (FY 79: 0M; Total: 0M). OMB agrees this initiative requires study.
Passive Solar Heating and Cooling		
Provide awards to architects and builders for innovative designs. (FY 79: 4M; Total: 34M)	Passive solar can be a significant energy saver, and awards may be the only way to heighten awareness and encourage use.	Support DoE initiative. (FY 79: 4M; Total: 34M). OMB supports this initiative at a reduced level.

Initiative	Analysis	OSTP Recommendation
Fuels from Biomass		
Accelerate R&D to produce energy products from biomass that are currently derived from petroleum. (FY 79: +5M; Total: +30M)	Much needs to be learned about the use of biomass as a replacement for depletable resources. Popular program with the public.	Support DOE initiative. (FY 79: 5M; Total: +30M) OMB supports this initiative.
USDA Solar Activities		
Increase work on biomass production and on agricultural applications. (FY 79: +5M; Total: +30M)	The initiative complements the biomass initiative in DOE.	Support the initiative. (FY 79: +5M; Total: +30M) OMB supports this initiative.
CEQ Biomass Initiative		
To provide model solar farm in each state. (FY 79: 5M; Total: 30M)	The initiative is a supplement to the increases already recommended for DoE and USDA.	Do not support the initiative. (FY 79: 0M; Total: 0M) OMB opposes this initiative.
CEQ International Solar Energy Development Initiative		
Expanded effort to encourage solar technologies in developing countries. (FY 79: 10M; Total: +150M)	Because renewable energy is dispersed and often not capital intensive, it may be particularly suited for the less developed world. At your instruction, this opportunity is currently being evaluated by DoE.	Postpone the initiative until the review is completed. (FY 79: 0M; Total: 0M) OMB agrees to examine in the Fall.
CEQ-Regional Solar Centers Initiative		
Provide separately identified funds for the four regional SERIs. (FY 79: 15M; Total: +90M)	In order to assure that funds for regional centers are dependent on their performance and on their ability to assist in meeting DoE objectives, the regional centers should compete for funds from established DoE programs.	Do not support the initiative. (FY 79: 0M; Total: 0M) OMB opposes the initiative.

OVERALL BUDGET AND TAX IMPACT [1/]

Fossils	FY 79	Total
DOE	249M	1606M
OMB	47M	170M
OSTP[2/]	96-126M	245-771M
Renewables		
DoE/CEQ	130M	1325M
OMB	25M	150M
OSTP[3/]	78-88M	309-355M

1/ Based on estimates provided by OMB.

2/ Uncertainty depends on strategy chosen for high BTU gas.

3/ Uncertainty due to political decision on appropriate technology initiative and on dispersed technology demonstrations.

CEA
COMMENTS

THE CHAIRMAN OF THE
COUNCIL OF ECONOMIC ADVISERS
WASHINGTON

May 1, 1978

MEMORANDUM FOR THE PRESIDENT

From: Charlie Schultze CLS by WW

Subject: Energy Supply and Sun Day Initiatives

We have briefly reviewed the proposals by DOE and CEQ, as well as the recommendations of OMB. Our conclusions are as follows:

A. Background

1. It will be critical to the health of the U.S. economy over the next two decades to develop alternatives to imported oil. The most likely alternative sources are oil shale, coal liquefaction and gasification, and high cost sources of natural gas. We do not now know (and in some cases will not know for decades) which of these will be most economical.

2. Direct use of coal (as in direct combustion) is falling far behind the schedule in the NEP. Current environmental requirements, and the major obstacles they put in the way of using low-sulfur Western coal may make it impossible to approach the coal conversion objectives. The recent increase in coal mine wages, the new requirements of the mine safety laws, and the black lung and reclamation taxes on coal all have led to an unfavorable shift in the economics of coal conversion.

   DOE's new initiatives recognize that we will need to give incentives for indirect use of coal, i.e., use through conversion to liquid or gaseous form.

3. Recent evidence on exotic sources (solar, biomass, geothermal, etc.) is that these technologies are very immature. It is likely that they will remain much more expensive than other fuels for a long time and thus will not replace oil and gas on a large scale in this century.

B. Comments on the DOE/CEQ Proposals

1. Given the sensitive and difficult problems of negotiation on the energy bill at this time, I feel that we should postpone all important new initiatives regarding energy tax and budget policy until after the energy bill is passed, except as they are part of an explicit negotiation on the energy bill.

   - The limited $3/bbl. tax credit for oil shale development proposed by DOE is superior to the unlimited credit proposed by Senator Talmadge. The credit is also superior to the Haskell proposal for a series of government-owned plants. We have no objection to its inclusion in the final energy bill, or as part of a negotiated package.

   - With respect to the other tax credits and budgetary increases, we see no reason to submit them now.

     -- Many of them are closely related to those under consideration by the Energy Conference. Why propose tax credits which we would otherwise use as a "sweetener" in the COET negotiations?

     -- The other items add to your budget. There is pressure to increase your FY 1979 DOE budget, but these should be resisted now. Again, as part of the final negotiations on COET, some give may be needed here, but we should not give these items away by sending up a new package now. After the energy bill is completed, we will have a much better idea of our overall budgetary resources and of the kind of new supply initiatives needed in the energy area. We could then plan a full-scale review and consider further initiatives for the FY 1980 budget.

2. The exotic sources are a bottomless sink for budget resources and have questionable payoffs. Many of the CEQ proposals (a solar farm in each state) sound romantic, but do not make good budgetary or energy sense. We should continue to pursue basic research in this area but avoid further unnecessary commitments to unproven exotic sources.

3. The most difficult policy decisions thus concern (i) the best way to promote development of a synthetic fuels industry, and (ii) a review of existing obstacles to direct coal conversion.

   a. DOE is considering (but does not yet propose) a Synthetic Liquids Utilization Program (SLUP). The SLUP would require that, each year, a percentage of all liquid fuels used in the United States be supplied from domestic synthetics. To ensure marketability the high costs of synthetics would be averaged ("rolled-in") with the lower cost natural liquids.

      One characteristic of this approach is that it circumvents the normal Congressional and Executive budgetary process. A major drawback of this regulatory approach is that, by circumventing a market test, incentives to hold down costs of synthetics are very weak. We would have no control over the amount of the subsidy. The program could therefore prove to be very costly and inflationary. Moreover, if refiners are required to buy synthetic fuel, and if the number of suppliers is limited, an unnecessarily high monopoly price could result. DOE would thus probably have to ask authority to control synthetic fuel prices.

   b. As an alternative mechanism for promoting synthetic fuel development, we prefer that tax and/or budgetary incentives be used.

      I am concerned about the piecemeal nature of our supply strategy (one set of proposals in April 1977, a second in May 1978, a third intended for the fall of 1978). Especially in view of the mounting problems with coal conversion, we think that DOE should spend the next few months developing the best strategy for converting from natural oil and gas to other fuels.

Also, up to now, other agencies have been brought into policy formation only at the very end. We think it is important that a supply strategy be developed jointly by DOE and the major economic and environmental agencies.

C. Recommendations

1. We should postpone new energy initiatives involving tax and budget policy until after the energy bill is passed, except in limited cases as an explicit part of negotiations on the energy bill.

2. DOE, in conjunction with major economic and environmental agencies, should develop a long-run supply strategy for inclusion in the FY 1980 budget and legislative program.

CEQ
COMMENTS

EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL ON ENVIRONMENTAL QUALITY
722 JACKSON PLACE, N. W.
WASHINGTON, D. C. 20006

April 28, 1978

MEMORANDUM FOR THE PRESIDENT

FROM: Charles Warren
Gus Speth

SUBJECT: Sun Day Initiatives

Next week on Sun Day you will have a unique opportunity to lead the Nation in its quest for energy self sufficiency and improved environmental quality. Not since Earth Day, eight years ago, has there been such a massive, popular statement of support for a new direction in American life. Earth Day marked the acceptance by this country of a new set of values, and Sun Day promises to evoke a similar reappraisal.

During the past few weeks we have been working closely with DOE and DPS in developing initiatives which we recommend you announce in your Sun Day speech. These are set out in detail in a memorandum which we prepared for DPS last week and include:

- making a major Presidential policy statement on solar energy,
- announcing significant increases in the Administration's FY 1979 solar energy budget,
- directing an interagency Domestic Policy Review of solar policy and programs,
- announcing that the NEP principle of replacement cost pricing of energy will be used in judging investments in conservation and renewable energy in federal buildings,
- calling for a UN Conference on Renewable Energy Resources and Technology, and
- retrofitting the White House with a solar hot water system.

The decision you must make on increased solar energy funding will undoubtedly be the most difficult. As part of your Sun Day address, we believe that you should reemphasize the total existing financial commitment to solar energy implied by the Administration's FY 1979 budget and the NEP tax credits. At the same time, we believe that significant additions to the FY 1979 solar budget are justified on their merits and are essential to a convincing demonstration of Administration commitment. The House Science and Technology Committee has increased solar funding by $134 million over the FY 1979 budget request, and the Administration's support for solar energy development will be judged in part by its response to this action. Budget increases in the solar area are probably inevitable, given Congress' inclinations. We believe the Administration should propose its own initiatives both to assert its leadership and to ensure consistency with existing programs and goals.

EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL ON ENVIRONMENTAL QUALITY
722 JACKSON PLACE, N. W.
WASHINGTON, D. C. 20006

April 28, 1978

MEMORANDUM FOR THE PRESIDENT

FROM: CHARLES WARREN

SUBJECT: DOE FOSSIL ENERGY SUPPLY INITIATIVES

You will soon receive a DOE fossil energy supply strategy memorandum and OMB budgetary comments thereon.

We have concerns about four of the DOE proposals based on environmental and health considerations and the necessity of proposed subsidies. The four proposals and our comments are summarized on the attached chart.

DOE PROPOSAL	CEQ RECOMMENDATION
1. Synthetic Liquid Demonstration Goal: To develop a capability to liquefy coal. Action: Proceed immediately to commit government funding for two plants; Implied commitment for funding additional plants later; Use sole source contracts at the 80%+ government funding level.	CEQ supports the OMB recommendation that all liquefaction processes and sponsors compete for funding of no more than one facility. Criteria for choice should include environmental, health and safety risk assessments and necessary level of government cost-sharing. CEQ Rationale • The existence of potentially serious environmental, health and safety risks associated with liquefaction facilities imposes a need for careful environmental monitoring of a demonstration facility before commitment to multiple plants. • Noncompetitive sole-source procurement of multiple liquefaction facilities at the 80%+ government funding level is clearly an inefficient use of limited government funds
2. Shale Oil Production Tax Credit Goal: To enhance the economic viability of oil shale. Action: Provide a $3/barrel tax credit for the first 10,000 daily barrels of production for the life of all facilities in service by 1987.	CEQ recommends rejection of this initiative and increased attention to assuring adequate environmental, health and safety monitoring of the two commercial projects now under construction. CEQ Rationale • Oil shale development should proceed slowly enough to resolve serious environmental difficulties. • The incentive is inappropriate to the capability demonstration goal. • The long term subsidy would be extremely costly. • The incentive is demonstrably unnecessary since two commercial projects are now under construction without substantial federal subsidy.

DOE PROPOSAL	CEQ RECOMMENDATION
3. High BTU Coal Gasification Goal: Transfer completion and economic risk to taxpayers or consumers. Action: a. Transfer non-completion risk to either taxpayers (through loan guarantees) or rate payers (through tariff mechanisms); b. Transfer marketability risk for three projects (and future projects by implication) to ratepayers through rolled-in pricing.	CEQ recommends that any risk transference be limited to tariff measures and that rolled-in pricing be explicitly rejected. Benefits should be limited to a single facility. CEQ Rationale • The existence of potentially serious environmental, health and safety risks imposes a need for careful environmental monitoring of a demonstration facility before commitment to multiple plants. • Rolled-in pricing explicity violates the pincipals of the President's National Energy Plan. • Rolled-in pricing is demonstrably unnecessary, since at least one sponsor has stated that he needs only debt security to allow immediate commencement. • Tariff measures are preferred to loan guarantees because FERC can tailor each decision to yield minimum necessary government support and is competent to adequately monitor project to prevent abuse. • Tariff decisions are preferable because they do not require the commitment to multiple plant subsidy inherent in the Loan Guarantee/Rolled-In Pricing initiative.
4. Advanced Coal Technologies Goal: Accelerate market penetration of three coal technologies. Action: Provide additional 10% Investment Tax Credit (for a total 30-35%) and five year amortization for industrial investment in fluidized bed units, low BTU gasification units and medium BTU gasification units.	CEQ recommends that consideration of this initiative be deferred pending outcome of the National Energy Act. • The NEA Investment Tax Credit for these measures is already generous (20-25%). • The President's budget contains substantial additional support for these technologies.

TREASURY
COMMENTS

THE SECRETARY OF THE TREASURY

WASHINGTON

April 28, 1978

MEMORANDUM FOR THE PRESIDENT

FROM: Robert Carswell
Acting Secretary

SUBJECT: Phase II Energy Supply Initiatives of the Department of Energy

The Department of Energy has solicited Treasury's comments on various energy supply initiatives proposed as revisions to DOE's FY 1979 budget request.

We have limited our comments to the initiatives that involve loan guarantees or tax incentives which are policy instruments for which Treasury has particular expertise and responsibility.

In general, Treasury believes that tax credits and loan guarantees are inefficient and expensive techniques for providing incentives and assistance to new industries. Treasury's general position on tax credits is well known to you. With respect to loan guarantees, Treasury believes they should be used only when there is a defect in the financial markets that prevents conventional financial, e.g., the New York City situation.

DOE's proposals aim to help new industries develop in anticipation of a sharp run-up in the prices of the energy products they will sell. The Treasury-preferred means to accomplish this aim is to provide limited price guarantees (at a predetermined price) and/or contracts that assure the purchase of specified amounts of products. These policy tools permit--indeed require--forecasts of actual liabilities to be assumed by the Government and facilitate the eventual transition of the industry to the private sector if it proves successful.

In contrast, a tax credit, being available to any taxpayer, presents real difficulties in estimating

aggregate cost to the Government and distorts our tax system.

Loan guarantees present similar problems. Unless addressed to capital market defects, they distort the credit markets, stultify the development of private financing arrangements for the favored industry, and provide Government benefits larger than necessary to encourage development of the favored industry. In the cases at issue, it would appear that conventional financing would be available if prices were guaranteed at a predetermined level or requirements contracts were provided.

TAX INCENTIVES

Income tax credit for shale oil

DOE proposes that the Administration seek Energy Tax Conference acceptance of a $3 per barrel credit for the first 10,000 barrels per day of production of shale oil plants placed in service by 1987. DOE estimates that this concession would reduce tax receipts by $1 billion over the period 1983-2006. Treasury lacks sufficient technical information to evaluate this estimate.

On the merits, Treasury believes a price guarantee or purchase agreement to be far superior to a tax credit for encouraging shale oil development. (However, providing both tax credits and purchase agreement incentives to the same firms would be an illogical approach.) As a matter of Energy Tax Conference negotiations, Treasury opposes making unilateral concessions on this issue. The Administration is on record opposing any credit for shale oil and should alter its position only in exchange for concessions on other items.

Advanced Coal Technologies

DOE proposes supplementing the House NEA provision for a 10 percent investment tax credit with a five-year straight-line depreciation allowance for advanced coal technologies. This would be equivalent to an additional 10 percent investment tax credit (creating an effective 30 percent credit for such technologies.)

On the merits, Treasury opposes targetting advanced coal technologies for such extraordinarily generous tax

subsidies; DOE planning figures suggest that their proposal would provide total incentives in excess of $6 a barrel. The Government's financial losses would be far lower from price guarantees or a program of grants for demonstration projects. As a matter of Conference negotiations, Treasury opposes abandoning the House provision without attempting to secure concessions on other items. If enlargement of the House provision is ultimately necessary, an increase in the additional non-refundable investment tax credit from 10 percent to 15 percent would be preferable to injecting a new form of tax subsidy (accelerated depreciation) into the Conference. A new subsidy might lead the Conference to search for new subsidies in other areas.

LOAN GUARANTEES

Treasury opposes DOE's proposed loan guarantees for enhanced oil recovery projects and for high-Btu coal gasification plants. Again, price guarantees or purchase agreements would be better tools if price uncertainty is in fact retarding development.

ORIGINAL DoE
REQUEST:
"1978 Supply
Initiatives"

1978 SUPPLY INITIATIVES

APRIL 20, 1978

U.S. DEPARTMENT OF ENERGY

OVERVIEW

INTRODUCTION

This document presents a set of supply initiatives designed to improve the Nation's capability to commercialize certain supply technologies. These initiatives build upon the existing National Energy Plan to insure a better balanced supply picture beyond the mid-1980's. A comprehensive National Energy Supply Strategy will be ready in the fall. In the meantime, work to date indicates that a number of initiatives can be recommended for inclusion in the FY 1979 budget and legislative cycle.

WORLD OIL OUTLOOK

Continually rising oil demand in the face of limited production capacity is at the heart of the energy problem. Worldwide oil consumption growth, contrasted with foreseeable limits to production by the oil exporting countries, indicates a high probability that oil will become more scarce and expensive during the 1980's.

The economic and national security consequences of rising dependence on increasingly expensive and unreliable foreign oil are amply evident today. In a future environment of scarce, expensive oil, the U.S. can maintain its patterns of economic growth only by reducing imports and by initiating now the inevitable shift away from petroleum.

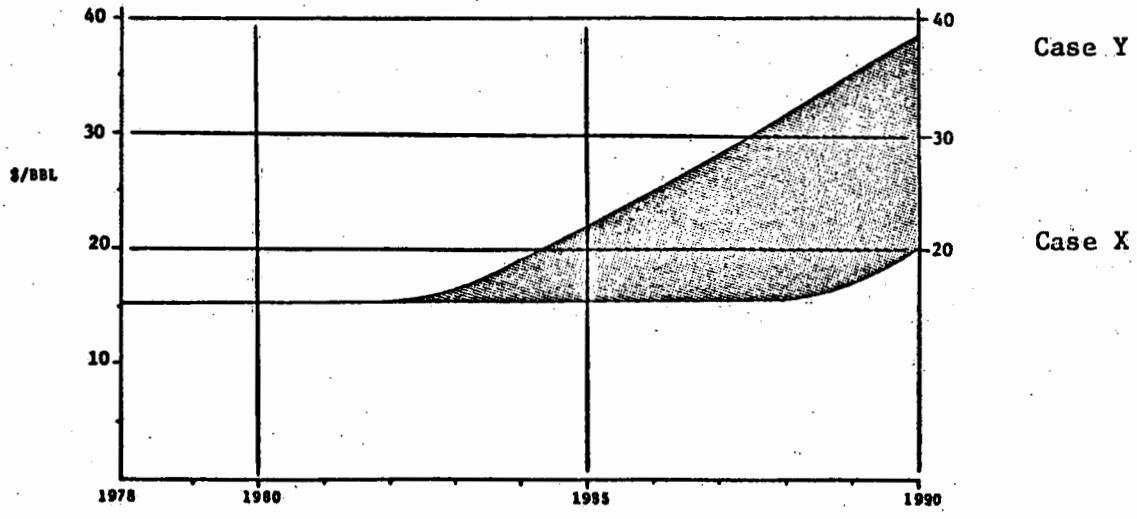
At the present time, worldwide oil production is approximately 60 million barrels per day. Although earlier estimates were higher, world oil production is unlikely to exceed significantly 70 million barrels per day in the future.

An examination of the future world oil market indicates the high likelihood that, if the existing level of OPEC prices remained constant in real terms, world demand for OPEC oil would exceed OPEC production capacity during the 1980's. Projected demand for OPEC oil is likely to grow from an estimated average level of about 32 MMBD in 1978 to a range of 42 to 45 MMBD by 1985, depending primarily on the assumed rate of economic growth. Yet OPEC production capacity is not likely to exceed 37 to 39 MMBD by 1985, unless a significant increase in development activity occurs.

Any shortfall of OPEC production compared to demand will make world oil markets tighten and oil prices rise. Estimates of how much and how far prices will rise, however, face two additional uncertainties: the feedback effects of high prices on economic growth and oil demand growth, as well as the measures importing countries would adopt to deal with scarce, expensive oil. Given these speculative conditions, two tests were made in order to identify the range of prices which might accompany alternative world oil outlooks. One set of assumptions (Case X) -- low world economic growth (3 percent), a communist oil export position (1 million barrels per day) and a higher OPEC capacity (39 million) -- revealed a shortage beginning in 1988. A second set of assumptions (Case Y) -- higher growth (4 percent), no communist imports or exports and a lower OPEC capacity (37 million) -- moved the date of the shortage to 1982.

Assuming that prices alone are relied upon to trim growing consumption to match static OPEC capacity, oil prices must rise sharply for a number of years in response to a worldwide shortage (see Figure 1). Even under middle-of-the-road assumptions, world oil prices could double sometime between 1985 and 1990.

Figure 1
WORLD OIL PRICE TESTS
($, 1978)



Although oil price increases during the 1980's are highly likely, the U.S. can influence the path of prices through its national energy policies. OPEC's ability to increase the price of oil in the future is weakened as non-OPEC countries increase production of oil or oil substitutes, or reduce oil consumption. Any reduction in OPEC export demand not only displaces expensive imported oil, but also increases the likelihood of relatively lower oil prices in the future. Such reductions would yield multi-billion dollar savings in foreign energy payments and, in turn, would make a major contribution to the U.S. economic health and national security posture.

THE NATIONAL ENERGY PLAN

Consistent with the need to reduce U.S. oil imports immediately, last year's National Energy Plan presented a careful balance of incentives and regulatory authority aimed at beginning a downward adjustment of U.S. oil import trends. Conservation measures were stressed in order to reduce consumption through more energy-efficient capital stocks. Crude oil and natural gas pricing were designed to further stimulate conservation and to increase domestic production without excessive, adverse economic impact. Incentives and regulatory authority were provided for a substantial shift to coal for stationary fuel uses. Finally, the plan provided new incentives for commercial use of renewable technologies.

When implemented, last year's measures will reduce oil imports substantially. But, they alone cannot maintain imports at a satisfactorily low level permanently. The U.S. must begin to have available a wide range of technologies to exploit production of its extensive, domestic resources.

In the National Energy Plan, the continuing nature of the U.S. energy problem was recognized and the view that a permanent national energy strategy must evolve in steps was adopted. To this end, a comprehensive energy strategy currently is under development. Scheduled for completion next winter, this effort will be known as the National Energy Supply Strategy (NESS). In order to insure public involvement and participation in the study effort, a major NESS outreach program is being developed, involving state and local governments, the Congress, and special interest groups. As part of this program, a Presidentially-appointed panel of distinguished citizens will be established to review and comment on the NESS draft report. This report and comments will serve as the basis for the second National Energy Plan, scheduled for completion in the spring of 1979.

Because the supply options which will become available in the long term will be expensive, a long term supply investment will make economic sense only in conjunction with a complementary investment in conservation. Consequently, the 1979 Plan also will address potential conservation initiatives which would insure efficient consumption of energy produced by longer-term supply technologies.

As imported oil costs increase and shifts to substitute fuels begin, it is important that our supply initiatives continue the commitment enunciated in the first National Energy Plan--to assure adequate energy supplies with balanced consideration for protection of the environment.

SUPPLY STRATEGY

The work to date indicates that an additional supply component could be recommended for inclusion in the FY 1979 budget and legislative cycle. This component addresses four major supply problems which are important in the 1980's and beyond:

- o Liquids: Last year's energy plan provided for increased coal use where possible in stationary installations while preserving liquid fuels for transportation. Even with these steps, high-priority, stationary uses of liquid fuels (such as industrial process use) will add substantially to import requirements during the 1980's. Transportation and other high-priority liquid fuels uses will persist well beyond the 1990's. Consequently, liquid fuel substitutes for crude oil must be found.

- o Gas: Currently, the U.S. has a major investment in the transportation, distribution and use of natural gas. Gas is generally cheaper than electricity for end-use applications and creates less environmental problems than other fossil fuels. Keeping this national asset fully productive represents another near term supply concern.

- o Coal: Last year's plan also stressed direct-burning of coal through conventional technologies. Further progress in substituting coal for utilities and industry requires accelerated use of advanced technologies which directly burn coal more cleanly or which cleanly convert coal to gas at or near major fuel burning installations.

- o Renewables: The 1977 NEP also addressed through tax incentive mechanisms a number of renewable sources of energy, such as solar and geothermal, energy. Nevertheless, much remains to be done to accelerate the commercialization of solar and other renewable technologies. This could be accomplished with programs that combine R&D and accelerated commercialization incentives.

For each of these supply problems, a range of new sources and technologies could become commercially attractive during the 1980's. In their current state of technical advance, most of these new sources are economically unattractive to private interests at today's oil prices, but will be economically attractive at the oil prices which are likely to accompany a worldwide oil capacity limitation. In varying degrees, all require extensive lead time -- for technical advances and for institutional adjustments to be made -- to render them, first, capable of widespread commercialization and, then, to build sufficient capacity to make a meaningful contribution to supply.

SUPPLY INITIATIVES

This document presents a set of supply initiatives which build a capability to commercialize supply technologies. Based on these initiatives and further analysis, next year's Plan could propose additional measures to induce major additions to capacity.

These supply initiatives build upon the existing National Energy Plan to insure a better balanced supply picture beyond the mid-1980's. Similar to last year's plan, these initiatives can contribute toward adjustment of our import levels as world oil production reaches its capacity limitation. But more important, they can provide a capability to weather the ensuing period during which oil will be scarce and expensive.

In the liquid supply sector, one initiative, which is set forth for the purpose of public discussion, is designed to accelerate supply from synthetic liquids:

-- a regulatory requirement for refiners and importers to use a fractional barrel of synthetic liquids for each barrel of crude oil refined or imported;

Three liquids initiatives are proposed to develop the capability to substitute synthetic liquids for crude oil:

-- a tax incentive to stimulate demonstrations of domestic shale oil production;

-- a program of price incentives applied selectively to enhanced oil recovery projects;

-- two commercial-scale plants to demonstrate synthetic liquids production from coal.

In the gas supply sector, two initiatives are proposed to contribute toward keeping the gas pipeline, distribution, and end-use system efficiently utilized:

-- expanded technology demonstration programs to stimulate earlier and more extensive production of unconventional natural gas from geopressurized zones, tight gas sands, coal seams, and Devonian shale.

-- accelerated construction of several commercial-scale, high-Btu coal gasification facilities achieved through regulatory changes and loan guarantees.

In order to increase the utilization of plentiful domestic energy reserves, one initiative is proposed in the coal supply sector:

-- a temporary tax subsidy for advanced coal technologies: atmospheric fluidized bed combustion and low- and medium Btu coal gasification;

A package of individual initiatives are proposed to accelerate commercialization of renewable and end-use technologies which can pay off in the near term. The package consists of:

-- increase research on photovoltaic solar energy;

-- commercial demonstrations of wind machines;

-- production of gas and liquid fuels from biomass;

SYNTHETIC LIQUIDS UTILIZATION
(for discussion only)

SYNTHETIC LIQUIDS UTILIZATION PROGRAM

PROBLEM: U.S. resources of oil shale, coal, and biomass potentially could yield more liquid fuel than can be produced from all the world's known oil reservoirs. But these massive resources now yield very little liquid fuel. The costs of using existing technologies are too high (from nearly twice to five times the current landed cost of imported oil - see Table 1), and newer technologies for shale oil, coal liquids, or alcohols that might yield lower costs are commercially unproven. Commercial-scale (50 MBD or larger) facilities cost over a billion dollars each and take three to six years to construct after environmental and other approvals are obtained. Industry now expects lead times from plan to production (including approvals) to run seven to twelve years.

By the time major new plants would be on line, anticipated rising oil prices could make these synthetic fuels competitive. But industry is uncertain both about future oil prices and about what actions the Government might take to moderate domestic prices. Hence, industry management is unwilling to accept the great technical and economic risks that synthetic fuel production entails.

To provide substantial synthetic liquids capability by 1990, action would need to be taken soon to create adequate incentives to begin the process of synthetic fuels commercialization. A regulatory approach could enable the Government to create the needed incentives and assure the markets for synthetic fuels without either raising taxes or adding to the Federal budget.

PROPOSAL: A proposal for the purpose of public discussion, would require that, each year, a percentage of all liquids used in the U.S. be from domestically produced synthetics. The proposal would set the 1982 and 1990 requirements and empower DOE to set the schedule between these years, within prescribed limits. The requirements would be imposed on all refiners and users of crude oil and importers of petroleum products. Each year, they would be required to produce or purchase quantities of synthetic liquids equivalent to that year's mandated percentage of their volume. To encourage compliance, a fine per barrel of deficiency would be imposed on users not meeting the required levels.

The requirement would begin at a relatively low level (e.g., 20 MBD) for 1982 and be phased gradually toward a 1990 goal of 700 MBD to 1,200 MBD. This goal represents roughly 3 to 5 percent of total anticipated 1990 crude oil consumption.

DOE would certify synthetics production and quality, audit and enforce compliance, and provide basic information the market would need to function smoothly. These activities are similar to activities DOE now performs. Roughly 250 firms would be subject to the requirement.

DISCUSSION: This initiative would generate a market framework within which choices of which fuels to produce, how to produce them, which fuels to buy, and how to use them would be left to the private sector. Each crude user or importer could establish its own production facilities, join with others in production consortia, or contract for new production of any liquid fuel not derived from oil, natural gas, or natural gas liquids. The fuels purchased could be used directly, processed, blended, or resold for others' use -- permitting maximum flexibility.

Through this market, those required to purchase synthetic liquids would effectively subsidize the producers by paying the difference between the synthetics costs and the world price of oil. Liquids users, rather than all taxpayers, would pay for the subsidy. Neither revenues nor expenditures would enter the Federal budget.

To accommodate both strong political interests and economic efficiency, the percent requirement could begin at a low level and increase gradually over time. Such a schedule would permit alcohols from biomass to gain a modest market.

This mandated market should sustain a significant synthetic liquids industry, once direct financial incentives have launched the industry. It would provide strong financial incentives to rapidly deploy least-cost -- though possibly still expensive -- technologies.

Impacts of the Proposal

The value of the program to society - considering both the near term cost of subsidizing the production of expensive synthetic liquids and the long term benefits of reducing U.S. oil imports - depends critically on future world oil

prices and in the actual costs of the synthetic technologies relative to the world price. If the world oil price should rise to $16 - 17/bbl, the 700 MBD program would save the U.S. economy as much in reduction of oil imports as it cost the U.S. economy to build and operate the synthetic facilities prior to the price rise. If world oil prices rise to $25/bbl, the program benefits society by $14 to $30 billion, depending on the resource costs of the synthetics. However, if world oil prices do not rise, the program costs society $7 to $19 billion. Even should low oil prices prevail throughout the period, the extra costs would not be unreasonable for an insurance program. Further insights into potential impacts and key policy issues pertaining to this approach are in Appendix I.

The complexity of this proposal argues for extensive public discussion before such a major program is formally proposed. Nonetheless, this initiative is one of the most interesting ideas put forward to encourage a significant synthetic liquids industry. Because the program could be cost effective and make a major difference in our capability to blunt the impact of major oil price increases in the 1980's, it merits further exploration.

TABLE 1

Estimates of Liquids Costs

Process	Product	Earliest Comercial Operation	(1978) $ Per Barrel Oil Equivalent As Turbine or Boiler Fuel	(1978) $ Per Barrel Oil Equivalent As Equivalent to Unleaded Gasoline
Biomass-Derived				
Methanol	Finished Product	Existing	35 - 45	35 - 45
Ethanol	Finished Product (Dry alcohol)	Existing	55 - 70	55 - 70
Shale Oil				
Surface Retorting	Syncrude	1983	20 - 35	26 - 44
In-Situ	Snycrude	1984	15 - 25	22 - 34
Coal-Derived				
Fischer-Tropsch	Syncrude & tars	Existing (SASOL)	35 - 45	40 - 53
Methanol	Finished Product	1982	25 - 40	25 - 40
Gasoline (thru Methanol)	93-Octane gasoline	Early 1980's	34 - 40	34 - 40
SCR-II	Residual Boiler Fuel	Mid-to-late 1980's	20 - 33	30 - 45
H-Coal	Syncrude	Mid-to-late 1980's	20 - 35	28 - 42
Exxon Donor Solvent	Syncrude	Mid-to-late 1980's	20 - 35	28 - 42
For Comparison:				
Petroleum				
Crude Oil at current US price			9	14
Crude Oil at current world price			15	20
Crude Oil at $25/bbl.			25	30

TABLE 2

Estimated Costs to Consumers in 1990 of Percent-Requirements Initiative With 700 MBD Synthetics Production

1990 Synthetics Costs	1990 World Oil Price (1978 $/Bbl.)	1990 Annual Costs (1978 $ Billions)	1990 Average Cost Increase For All Liquids
Low	15	1.7	1.2%
High	15	3.9	2.9%
Low	25	Negligible	0
High	25	1.5	0.6%

TABLE 3

Insurance Value of Initiative in Responding to Major Oil Price Rise (Assumes No Price Controls or Environment Constraints)

Oil Price in 1990 (1978 $/Bbl.)	Synthetic Costs	Year-2000 Synthetics Production Without Initiative (MBD)	Year-2000 Synthetics Production With Initiative (MBD)	Net Present Value (Billions of 1978 $)
15	Low	285	700 **	- 7
15	High	115	700 **	-19
25*	Low	1,360	1,910	+23
25*	High	760	1,210	+ 9

* Assumes oil prices rise from $15/bbl to $25/bbl between 1980 and 1990 and remains at $25/bbl thereafter.

** Assumes requirement maintained to 2000 at 1990 level.

The 1990 world oil price at which the initiative breaks-even (i.e., neither costs nor saves financially on net) would be roughly $16 per barrel if synthetics costs prove to be at the low end of current estimate ranges and would be roughly $17 per barrel if synthetics costs turn out to be at the high end of the range. The analysis assumes a 6% real discount rate and assumes that a reduction in U.S. import levels of 1 MMBD will reduce world oil prices by $0.50/bbl if world prices rise above $15/bbl.

SHALE OIL

SHALE OIL PRODUCTION

PROBLEM: Vast quantities of high quality oil shale underlie a small region of Colorado and Utah. Although "nearly ready" for many years, Western oil shale has not been produced commercially because of unfavorable economics and environmental uncertainties. Currently, shale oil is estimated to cost from $15 to $35 per barrel (depending on the technology, financing terms, and environmental controls). The most probable range is $15 to $25 per barrel, thereby making oil shale our lowest-cost, synthetic liquids option.

Shale oil capital costs are high; approximately $1 to $1.25 billion for a 50 MBD plant. Commercial production of oil shale also may be constrained by air quality requirements, water effluent limits, or water availability in the Colorado/Utah area. And stringent environmental controls may increase the costs of shale oil substantially.

PROPOSAL: A three-part program is proposed to accelerate shale oil development:

- The Administration would work with the Conferees on the energy tax conference toward developing a limited version of the oil shale tax credit currently in the NEA tax conference. The Administration could support a credit limited to the first 10 MBD of production from commercial shale oil plants placed in service by 1987. The credit would continue throughout the life of qualifying plants or 20 years, whichever is shorter. Measures for phasing out the tax credit, in the event world oil prices exceed the cost of oil shale production, will be explored with the tax conference.

- Additional incentives may be needed to encourage development of full-scale commercial production. Consequently DOE will evaluate the possibility of the Federal Government buying the output from commercial-sized plants, either thrugh a DOE or a DOD purchase arrangement.

- Regulations are being announced to provide oil shale and other synthetic liquids the same entitlements treatment as imported crude oil.

DISCUSSION: The initiative is designed to establish a capability for commercial shale oil production. It will encourage those firms which are actively developing technology to build commercial-size plants. Three industrial groups using above-ground retorts and two using modified in situ recovery technology appear to be capable of placing 10,000 barrels per day or larger modules in service by 1987. If they were all to respond to the initiative, the Nation would have five different industrial groups producing a total of 50 MBD or more by 1987 and capable of increasing production to several hundred thousand barrels of oil per day shortly thereafter, if conditions warrant.

The economics of oil shale and, therefore, the industrial response to these initiatives are difficult to predict. The most probable range of shale cost estimates is from $15 to $25 per barrel in 1978 dollars, with most centering around $20. The tax credit would lower the required selling price by $5 to $6, and the entitlements would reduce it by another $2, bringing the required selling price to $12 to $13 per barrel.

This is less than the current cost of imported oil, possibly making shale oil competitive as a fuel oil (especially in mixtures with conventional residual oil). But the value of shale oil as a refinery feedstock is less than that of crude oil by about $5 per barrel. The incentives, therefore, place shale oil in the competitive range, but uncertainties and individual differences affect the economic viability of individual projects. Differences in the shale resource cost, the quality of the shale, the technology used (in situ is thought to be less expensive), the method of financing, and the extent of environmental control technology required can each make several dollars per barrel difference in the actual cost.

The revenue loss from the tax credit is estimated to total $1 billion over a period from 1983 until after 2000. The present value of this revenue loss is about $200 million. If the world oil price were to exceed the cost of oil shale production, measures to phase out the tax credit would reduce the cost to the Government.

The impact and cost of the Government purchase is more difficult to assess. One firm indicated its willingness to build a single

module of an above-ground retort with the limited tax credit, but another has indicated its preference for proceeding directly to a full-sized, above-ground retort plant. An assessment of the need for a Government purchase and the details of a purchase program are currently under review. If the purchase price were relatively low and the price of world oil increased rapidly, the Government could end up making money.

The limited tax credit will encourage the controlled development of shale oil production by allowing environmental problems to be worked out at the single module scale before full-scale commercial plants are built. In addition, DOE will expand its environmental research and assessment activities to keep pace with expanded oil shale development. These activities will include pollutant characterization, monitoring and identification of health effects.

EOR

ENHANCED OIL RECOVERY

PROBLEM: Oil recoverable under enhanced oil recovery (EOR) techniques represents a domestic resource of between 11 and 42 billion barrels. Estimates of additional supplies available with EOR methods range from a low of 1 MMBD to a high of 8 MMBD in 2000 depending on the world oil price and the rate at which additional experience with EOR recovery methods is obtained. Uncertainty over the returns available from EOR investments and the highly capital intensive nature of those investments may limit EOR development.

The chemicals and gases injected into the ground in advanced EOR techniques require investments of $8 to $15/bbl of oil recovered. As experience with EOR increases and oil recovery rates improve, the level of expenditure per unit output will decrease.

Since large initial capital requirements are necessary for EOR production, smaller producers may require financial assistance to enable them to make the large initial capital investments for EOR development.

PROPOSAL: The incentives for EOR include:

- o DOE would issue regulations to allow EOR production to be sold at the world oil price.
- o DOE would consider guaranteeing prices above the world level for production from certain EOR projects which demonstrate economic, technical and environmental feasibility.
- o DOE would consider the need for guarantees for small producers unable to obtain financing for otherwise viable EOR projects.

If appropriate projects developed through working with industry, DOE would request funds in the 1980 budget.

DISCUSSION: The objectives of this proposal are to gain experience with EOR technologies, and to reduce costs and provide the basis for accelerated EOR development.

Price guarantees can be made under Section 7(a) (4) of the Federal Nonnuclear Energy Research and Development Act of 1974, Pub. L. 93-577. These guarantees could be used by producers to increase the expected rates of return from EOR projects to make them competitive with other projects. Projects which demonstrate new EOR techniques and which would be uneconomic at current world oil prices could be eligible for the guaranteed price.

Price guarantees could be structured on a project by project basis. An average subsidy of $3/bbl above the world price could be provided for production of approximately 80 million barrels of oil.

Modification of the entitlements program to allow EOR the world oil price will provide additional economic incentives to all qualifying EOR production. In addition, DOE will examine the need for measures such as loan guarantees to encourage EOR production by independents. Loan guarantees for small producers may be needed because of the capital intensive nature of EOR projects.

The potential benefits of the incentives will be very large. For the program to break even in terms of Federal investment, only a small portion of the estimated incremental production need be realized. However, too little information is available about EOR technology to assess the probability that the combination of price supports for selected projects and the world oil price for all qualifying EOR production will result in achievement of those goals. These issues will be fully explored in the context of the FY 1980 budget.

SYNTHETIC LIQUIDS COMMERCIAL DEMONSTRATION

PROBLEM: Coal can provide a large supply of synthetic liquid fuels for the United States, but the technology has not yet been demonstrated on a commercial scale in this country. Processes to convert coal to liquids, used in Germany during World War II, are now producing synthetic gasoline in South Africa, (but at very high cost, about $40/bbl).

A number of new processes are now being developed in the United States, mostly with Department of Energy funding, to produce lower-cost products. The most advanced are:

- Solvent Refined Coal liquids (SRC II), developed for the U.S. Government by Gulf Mineral Resources; a variant of the SRC II process called SRC I produces a clean solid fuel from coal which could be used in coal-fired utilities or industrial boilers
- H-Coal, developed by HRI; pilot plant being built by a consortium led by Ashland Oil
- Donor Solvent, by Exxon.

Each of the processes differs slightly from the other in the way it hydrogenates the coal, the products it produces, and the status of the pilot plant activities.

The Department of Energy has indicated its interest in proceeding with commercial demonstrations with industry if arrangements can be made for equity participation by industry in the plant construction and for sale of the products to users.

Gulf has made a proposal to the Department to proceed with the first 6,000-ton per day (20 MBD of synthetic liquids) module of an SRC-II plant. A group of firms, including Southern Company Services, Wheelabrator-Frye, Air Products, and Alcoa, is discussing a possible SRC-I facility. Ashland has indicated its interest in proceeding to a commercial-scale plant with H-Coal. Exxon has indicated that it prefers not to commit its resources to a commercial demonstration until it receives data from its large pilot plant (scheduled for completion in late 1979).

The cost of products from all of these processes is considerably above current world oil prices. Liquids from commercial plants are estimated to cost $20 to $35 per barrel, while the

products from initial modules would cost an additional $5 to $10 per barrel. The cost of SRC-I products would be slightly less than the liquids, but the value of its products would also be lower. In the absence of a dramatic oil price rise, subsidies would be required for any of the processes to move forward.

PROPOSAL: The development of all options as rapidly as technically feasible would most effectively establish the capability to produce domestic synthetic fuels from coal. Given the differing states of process development, the following actions are proposed:

- o As soon as possible, initiate preliminary designs for one liquid and one solid solvent-refined coal commercial demonstration plant. The designs would be for nominal 6,000 ton per day first modules, which could be expanded to 5 module commercial plants. DOE would enter into sole-source contracts with Gulf Minerals (SRC-II) and Southern Company Services (SRC-I) for Phase I preliminary design studies, costing about $6 million each and taking about 6 months to complete.

- o If the results of the Phase I studies and parallel business negotiations on cost sharing for construction, operations, and purchase of products prove successful, proceed with the detailed design and construction of the SRC plants.

- o Announce the Department's intent to proceed with other synthetic coal liquids commercial modules. While it is possible that additional proposals would be funded on a sole-source basis, it is most likely that a competition would be initiated among all firms who may wish to design and build synthetic coal liquids commercial demonstrations.

DISCUSSION: Given the long history of problems with coal gasification and liquefaction processes that go back to Interior's Office of Coal Research and ERDA (e.g., Project Gasoline and COALCON), it is essential that initiatives in this area be designed to deal effectively with a range of technical and policy issues in order to achieve progress at the maximum feasible pace. The technical issues involve:

- o the operational reliability and economics of the plant since some of the steps such as gasification of the residual char or pitch from the coal liquid processes and the solids-liquids separation for SRC-I have never been demonstrated;

- o the environmental and occupational health problems raised by effluents from the plants;
- o the cost of construction and operation;
- o the market suitability of the products, in particular the impact of EPA's new source performance standards on the acceptability of using SRC-I without additional clean up technology.

Policy issues arise around:

- o the competitiveness of the process for selecting the firms and sites which receive Federal support;
- o the perceived balance between taxpayer interests and corporate profits in the financial arrangements (e.g., how are the estimated costs and overruns shared, and are the beneficiaries of domestic and foreign patent rights paying a fair share of costs);
- o the equity of large Federal funding for large oil companies to broaden their business activities into coal synthetics production. (The only potentially viable coal liquids projects are sponsored by oil companies.)

A final concern is how to minimize the adverse political and financial impacts if it becomes apparent that a particular project will not be successful and it becomes necessary to cancel construction at a particular site.

Under the Gulf proposal, the Federal government would fund 80 to 90 percent of the cost of the SRC-II plant, or about $600 million. Gulf would be able to buy the plant from the government in order to build additional modules at its own expense. The electric utilities have indicated a willingness to purchase the liquid products at a premium price.

Negotiations on the SRC-I plant with Southern Company Services, Wheelabrator-Frye, Air Products, and Alcoa are still in the discussion phase, but are expected to result in a similar combination of Federal design and construction funds, equity from some firms, and purchase arrangements with others.

The proposal to proceed with the SRC plants on a sole-source basis is expected to result in operation of the first modules in about 1983 and operation of the full-scale commercial plants in 1987. Although there are risks and financial costs associated with the non-competitive procurements, alternative procurement approaches could delay this schedule by a number of years.

A decision on how to proceed with other projects remains open. An open competition, perhaps later this year or next year, would serve to blunt criticism about the sole-source procurements for SRC.

Despite the competition problems, the alternatives to not moving ahead with the SRC projects are even less desirable. It would be several years before all the processes could compete on a comparable basis. Even at that point, it is likely that more than one coal liquids plant would be funded. Since that option is available even with moving ahead with SRC II now, the delay may result in no practical competition difference. A short delay also assumes that both H-Coal and Exxon Donor Solvent projects encounter no problems in pilot plant construction and operation. If delays do occur, which is likely in the real world, the coal liquids initiative could drag on for an even greater period of time.

In any case, DOE would fund preliminary design studies for the SRC projects to determine whether detailed design and construction make technical and economic sense. That decision would not be made until the six months studies are completed. If conditions change, DOE would be in a position to pursue a different strategy.

The net benefits to the U.S. economy of undertaking initiatives to promote rapid commercialization of SRC plants depend upon future world oil prices and the amount of acceleration induced by the proposed demonstration program. Currently, the size of of this induced effect is difficult to predict. Consequently, the benefits of the program were assumed to include only the oil imports saved directly by two SRC plants (each 20 MBD capacity) and the small world oil price reduction caused by slightly reducing future excess OPEC export demand over its capacity limitation.

On this conservative basis, the two-plant program would save the U.S. economy as much in oil imports as it cost to build and operate the plants if world prices rise to $16.00. A more extreme price rise, to $25 in 1990 and beyond, would yield a positive net benefit to the U.S. economy of $1.4 billion (see Table 1). A much less likely comparison, indefinite continuation of today's $15 oil price, would yield a net cost of $.4 billion.

The budget requirements are estimated as follows:

TOTAL BUDGET AUTHORITY (in Millions of 1978 Dollars)

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	TOTAL 1979-84
SRC- I:	$ 60	$150	$130	$ 90	$ 70	$ 55	$555
SRC-II:	155	155	100	70	55	40	575
Other Commercial Plants	-0-	NA	NA	NA	NA	NA	NA
	$215	$305	$230	$160	$125	$95	$1130

NOTES:

NA - not available; depends on number of plants, size, cost sharing arrangements, etc.

The above Table presents total costs for SRC I and SRC II. Funds for SRC II are already included in the FY 1979 Budget and outyear commitments. The initiative accelerates the SRC II plant by one year, provides additional funds for SRC II ($89 million), and adds the SRC I facility. The Budget Implications of the 1978 Supply Initiatives table show the incremental funding.

Table 1

BENEFITS OF SYNTHETIC LIQUIDS DEMONSTRATION PROGRAM

World Oil Price in 1990 (1978 $/bbl)	Direct Production from Initiative (MBD)	Net Present Value (billions of 1978 $)
15	40	- .4
25[1/]	40	+1.4

1/ Assume oil prices rise from $15/barrel to $25/barrel between 1980 and 1990 and remains at $25/barrel thereafter. The analysis assumes a real discount rate of 6% and assumes that a reduction in U.S. import levels of 1 MMBD will reduce world oil prices by $.50/bbl if world oil prices are rising above $15/bbl.

UNCONVENTIONAL NATURAL GAS

PROBLEM: Conventional natural gas production peaked in 1975 at 19.5 trillion cubic feet (TCF) of net marketed production, and has since declined to about 18 TCF. Even with new incentive pricing and eventual deregulation, production in 1990 is expected to drop below current levels.

Four sources of unconventional natural gas have the potential for providing additional gas by the late 1980's. They include: geopressurized methane, gas from tight sands, Devonian shale gas, and coal bed methane. Geopressurized gas has not been produced commercially because of both technological and environmental uncertainties, and unfavorable economics. In addition, major unresolved questions remain with respect to the extent of the recoverable resource base. Gas from tight sands and Devonian shale has been produced commercially for many years, but only from the highest quality portion of the resource base. Ultimate recovery would be greatly enhanced by timely and widely adopted improvements in completion and fracturing techniques. Finally, three separate inducements for production of coal bed methane are required: removal of institutional barriers, improved technology for drilling and fracturing for removal of methane prior to mining, and the establishment of a market for low to medium Btu gas that could be recovered as mining occurs.

As a group, these four sources have a high but uncertain potential energy payoff. Significant increases in production from these four sources would become more likely with further development of production technologies and better characterization of the resource base.

PROPOSAL: DOE would propose the following two initiatives:

- o Price Incentives. Either version of the natural gas bill now being considered by the Conference would provide an enhanced economic climate for development of unconventional gas resources, either through deregulation or a high ceiling price.

- o Accelerated Technology Development. Resource characterization and technology development would be accelerated by selective increased levels of near-term Federal funding as follows:

  - Geopressurized and Hydropressured Methane - The proposed Federal drilling program would be accelerated to provide a total of nine wells (six more than previously planned) over the next 2 years in geopressurized zones and three

wells in hydropressured zones in FY 79 and FY 80 at an incremental budget cost of $18 million in FY 79 and $33 million in FY 80 ($69 M total program cost).

- Tight Sands - An additional $5 million would be provided in FY 79 and $15 million in FY 80 to further analyze and develop the appropriate Federal role in maximizing the benefits from this resource. Additional funding could be provided in subsequent years if indicated necessary for maximum development.

- Devonian Shale and Coal Bed Methane - An increase of $4 million for FY 79 and $10 million in FY 80 would enable further research in these significant gas resources.

In addition, DOE is reviewing the need for further initiatives to promote early exploitation of these resources.

DISCUSSION: Though difficult to characterize, the potential contribution of unconventional gas resources could be high--as much as 2-3 TCF annually by 1990 with no new initiatives. A higher price of around $3.00/MCF could lead to significant incremental production above that base.

However, the higher price alone will not provide maximum development of these resources. Joint government and industry funding of resource characterization and accelerated technology development could provide impetus to permit maximum development of these resources during the critical 1980's and early 1990's. A recent DOE contract study estimated that a multifaceted Federal program of research and development could lead to potentially large payoffs -- nearly 5 TCF of incremental production by 1990. Less favorable assumptions still suggest significant potential for incremental production. Should these estimates of production potential prove to be too high, the information gained about the size of the resource base and the cost of extraction would still justify the program.

Geopressurized Methane requires an accelerated demonstration effort. The technically recoverable portion of the resource base may be 50 to 500 TCF (but the economic portion may be substantially less). Critical factors such as production rate and well life are unknown because of the lack of private experience. Environmental issues regarding brine disposal and risks of surface subsidence remain unresolved. Private industry is not expected to pursue development of this resource in the forseeable future because of the high degree of economic uncertainty as

compared to alternative projects. Yet, accurate assessment of this resource potential is essential to energy planning for the 1980's and 1990's. Accelerated Federal drilling proposed in this initiative will provide knowledge for planning purposes, as well as establish and widely disseminate information on economic questions to which private industry can respond.

Tight Sands - The resources are reasonably well identified and substantial - they may be as high as 200 TCF. Price incentives alone could provide a significant incremental response by 1990. However, a joint Federal/private research and development effort in fracturing technology has the potential to accelerate the rate of development of the resource in the late 1980's. An increase of $5 million in FY 1979 and $15 million in FY 1980 above the current request of $6 million would afford the means for the development of an appropriate Federal role and further identification of the resource potential.

Devonian Shale - Ultimate recovery from Devonian shale is estimated at approximately 8 TCF at a price of $3.00/MCF. Ultimate recovery could be increased by as much as 6 TCF through improvements in dual completion technology (wells that pass through more conventional gas bearing sands as well as the Devonian Shale). DOE expenditures for R&D are currently $12 million in FY 79. An increase of $2 million in FY 79 and $5 million in FY 80 would be directed at establishing the feasibility of dual completions.

Coal Bed Methane - Ultimate recovery of methane from coalbeds is estimated at 1-2 TCF in the Eastern Area and up to 20 TCF in the Western Area. But significant development will not occur without improvement in initiatives and technology. A budget increase of $2 million for FY 79 and $5 million for FY 80 will be directed at resource identification, identification of methods for mitigation of institutional problems, and relating conventional drilling and fracturing techniques to coal bed methane development in both the Eastern and Western coal areas.

Compared with other incentives under consideration, the development of unconventional natural gas could have the largest potential payoff for the least degree of Federal involvement. The environmental benefits from the development and use of natural gas are significantly greater than those from any other energy source. Only the production of geopressurized methane gives rise to environmental concerns (brines and subsidence) both of which appear to be tractable.

Price incentives and Federal funding, as a combined program, present the most appropriate means for obtaining essential information now unavailable. The absence of adequate data on price guarantees renders such a program timely and valuable. A guaranteed price for a given number of wells or quantity of gas would have little rational basis, for the price might yield useful information or it might not. Eligible producers would drill only the most favorable prospects and could quickly exhaust the limited funds supporting a price guarantee, creating a substantial windfall and little useful information.

HIGH-BTU COAL GAS

PROBLEM: High-Btu coal gas could become a substantial source of supplementary domestic gas supply. Although a number of projects have been actively promoted in recent years, private industry has yet to build the first commercial-scale plant. Delay has been due primarily to: problems in obtaining siting approvals; uncertainties about the acceptability of the technology; marketability risks due to the high cost of coal gas relative to other sources of supply; and debt repayment risks in the event of plant non-completion. The non-completion risk is a major problem because corporate worth of project sponsors is relatively small compared to the capital needed to build a high-Btu gas plant ($1.6 billion/250 MMCFD plant).

The relatively high cost of coal gas could be met by a favorable FERC ruling on rolled-in pricing. The non-completion risk could be eliminated either by Federal loan guarantees or by FERC tariffs that would allow for a project's outstanding debt to be spread over a large number of gas users.

While the total market potential of high-Btu coal gas as a long-term supply source is uncertain, the technical, financial, and institutional experience which the first few plants would provide the industry is important to build the capability for more rapid expansion.

PROPOSAL: DOE would review proposed high-Btu gas projects on a case-by-case basis to determine the most appropriate means of reducing the risks of non-completion, either by:

- o intervening before FERC to argue for tariff protection against non-completion, or by
- o providing a Federal loan guarantee.

The review would consider the size of the rate payer base, the incidence of the benefits of the project (the rate payers vs. the general public), the institutional and technical risk of failure, the financial structure of the project, and the cost of project failure. This special coverage for non-completion risk through loan guarantees or intervention before FERC would be provided only for the first few plants.

Of most immediate importance is that DOE continue to develop criteria and processes for the case-by-case review, develop regulations, request appropriate authority from Congress to allow DOE to grant loan guarantees promptly, and develop a strategy for intervening before FERC.

There are several possible strategies for intervening before FERC. FERC could provide noncompletion guarantees either through modification of conventional tariffs, or by treating the first few facilities as RD&D expenditures for consortia of gas transmission and distribution companies. The latter approach represents an extension of FPC's Order No. 566. FERC could allow a contingent pass-through of costs over a period of years under order No. 566 in the event of non-completion.

DISCUSSION: The incidence of the costs and benefits of the project is a key issue in evaluating whether loan guarantees or non-completion tariffs are more appropriate for a given high-Btu gas project. Both loan guarantees and a non-completion tariff act to spread the risks of project failure beyond a particular project sponsor. Whether the rate payers of a particular pipeline (or pipeline consortia) or the general public should bear the costs if the project fails should be decided on a case-by-case basis.

Supplementary gas sources such high-BTU coal gas have substantial economic benefit. In the residential sector, for example, high-BTU coal gas already would compete favorably with the alternative use of electricity. In other sectors, it would provide oil import benefits of two kinds. One would consist of a direct reduction in oil and LNG imports. The other would consist of a world oil price reduction caused by minimizing the excess demand for OPEC oil over potential future capacity limitations.

The one to three plants proposed in this initiative would provide insurance that the United States would have technical expertise to support a more rapid buildup of extra plants in anticipation of elevated oil prices. At this juncture, the magnitude of this accelerated buildup is difficult to estimate; consequently, the costs and benefits estimated here ignore the real value of this induced effect.

On this conservative basis, the program would save the United States economy as much in reduced oil imports at a $17 world oil price as it would cost to build and operate three plants. A more extreme price rise, to $25 in 1990 and beyond, would yield a net benefit of $2.5 billion (see Table 1). A much less realistic evaluation, indefinite continuation of today's $15 oil price, would yield a net cost of $2.2 billion.

Initial output from the first few coal gas plants could cost $5 to $6/MCF (1978 dollars) declining to $3.00-3.50 after 25 years. This is comparable to alternative substitute fuels priced at $20 or $25 a barrel oil equivalent. The projected production costs of coal gas from the first few plants are high compared to estimated conventional gas costs in the early 1980's and, therefore, rolled-in pricing would be necessary for high-Btu gas projects to be economically viable in the near term. A list of proposed gas projects and their current status is presented in Table 2.

The first several high-Btu gas plants are expected to have an aggregate capacity of about 625 MMCFD (by 1990), cost about $4 billion, and incur debt of $3 billion. The capital and debt requirements are highly uncertain since most projects are at such an early stage. The risks to project lenders of plant non-operation are due to regulatory and institutional factors, and need for plant modifications and retrofits. The risk to lenders exists since project sponsors lack the net worth to guarantee the project debt.

While it is important to insure the availability of sufficient funds to cover project debt in the event of non-completion, it is highly unlikely that loan guarantees or tariffs would be required to cover the full amount of the debt as some project assets are salvageable. The cost of non-completion guarantees to the government or the rate-payer is likely to be insignificant for several reasons: first, the probability of non-completion is minimal, and second, if noncompletion does occur the real cost to be paid, after recourse to project assets, is likely to be only a few hundred million dollars, depending on how much of the plant has been completed. These guarantees, therefore, are best viewed as insurance policies to protect against the unlikely and unexpected.

Although the environmental impacts of the first three high-Btu gas plants would be limited to specific areas, a commitment to a large-scale high-Btu industry would raise such issues of national concern as:

- the availability of an adequate number of acceptable sites for high Btu gas facilities;
- availability of adequate water supplies;
- the attractiveness of gas vs. alternatives as a fuel source over the long term.

Table 1

BENEFITS OF THE HIGH-BTU COAL GAS INITIATIVE

World Oil Price in 1990 (1978 $/bbl)	1990 Direct Production From Initiative (MMCFD)	Net Present Value (billions of 1978$)
15	625	-2.2
25[1/]	625	+2.5

1/ Assumes oil prices rise from $15/bbl to $25/bbl between 1980 and 1990 and remain at $25/bbl thereafter. The analysis assumes that a reduction in U.S. import levels of 1 MMBD will reduce world oil prices by $.50/bbl if world oil prices are rising above $15/bbl. Three full-sized plants (250 MMCFD) were assumed to be on line by the year 2000.

Table 2

STATUS OF HIGH BTU COAL GASIFICATION PROJECTS

Project Sponsor	Site	Capacity (MMCFD)	Estimated On-line Time Frame	Project Status
American Natural Resources-Peoples Gas	N.D.	250, phased in	1984 for first 125; 1989 for second 125.	Forming consortium to own and finance the first 125 MMCFD unit. Most permits already already obtained. Tariff case is currently before FERC.
EL Paso-Pacific Gas Ruhrgas (West Germany)	N.M.	500; phased in	1985 for first 75, 1990 for second 75, 1995 for 125; No plans for last 250 capacity.	Requires business lease from Navajo tribe and water rights. Has not submitted tariff request to FERC.
WESCO (Pacific Lighting-Texas Eastern)	N. M.	250	1986	Requires site lease from Navajo tribe; modification of earlier FPC tariff required.
Wichita, City of	Kan.	250	Cancelled	Voters rejected project; main pipeline participant (Panhandle) reportedly has withdrawn.
Peoples Gas	N.D.	250	1988-1995	Project is on company books but not being actively pursued.
Panhandle	Wyo.	250	1988-1995	Panhandle undertook preliminary engineering analysis, but ceased activities on the the project. No permits have been applied for and no project EIS has been initiated.
Tenneco	undisclosed	500	1990-2000	Owns coal rights; has not yet undertaken site-specific environmental analysis; has not yet applied for permits.

ADVANCED COAL TECHNOLOGIES

PROBLEM: Three advanced coal technologies--fluidized bed combustion and low and medium Btu gasification--could play a significant role in replacing oil and gas in the industrial sector should world oil prices rise.

Specifically:

- o Fluidized bed combustion (FBC) can burn coal and other fuels in an environmentally acceptable manner under current standards without use of flue gas scrubbers. Initially, the primary market for FBC is the boiler market, where FBC is cost-competitive with direct coal use with scrubbers.

- o Low-Btu gas (LBG) can be produced through a number of simple, well-known, commercially available processes which partially burn coal with air and steam to yield a fuel gas. While LBG has limited retrofit applications and cannot be used as feedstock, new facilities can be readily designed to use low Btu gas. LBG could play an important role in providing a coal based fuel for non-boiler or process uses.

- o Medium Btu gas (MBG) is produced through processes similar to LBG, but with oxygen instead of air. MBG is a very flexible gaseous fuel which can be used in new and existing units, both as a fuel and as a feedstock. The economic production of the oxygen requires a minimum efficient plant size of approximately 6 MBD of oil equivalent. Fewer than 100 existing industrial plants are large enough to use the equivalent of 6 MBD, and complicated institutional arrangements may be required to provide fuel to a number of industrial customers. If institutional arrangements for distributing fuel to multiple users could be demonstrated, MBG would attract a much larger industrial market.

The potential markets for these technologies are very large--there is no technical reason why FBC, LBG, and MBG could not be used to satisfy a large portion of industrial energy needs by the year 2000. Advanced coal technologies, however, are likely to capture only a small portion of their potential markets by the year 2000 because conventional technologies are more familiar to industrial users. LBG and MBG are becoming more attractive sources as potential curtailments make pipeline gas supplies to industrial customers either unavailable or undependable. Use of new coal utilization technologies could reduce industrial shifts to oil that may otherwise occur. Also, these technologies may be a more attractive way to use coal in compliance with environmental regulations.

The lack of domestic operating experience with these technologies will inhibit the industrial shift to coal-based fuels as world oil prices rise. The oil and gas user tax and rebate and 10 percent investment tax credit now in the NEA tax conference would provide some incentive for use of advanced coal technologies; but the tax would affect boiler-fuel use primarily, and further incentives for non-boilers are needed. The proposed initiatives would further reduce time lags by providing industry with tax incentives to adopt these technologies now.

PROPOSAL: The proposed initiative:

- o provides an additional 10% investment tax credit and a five year depreciation for fluidized bed combustion and low and medium-Btu gasification. The full incentive would be available from now until 1983, would decline to 2/3 in 1984, 1/3 in 1985, and would disappear in 1986. (This declining balance is proposed to assure the tax credit would phase out.) These tax incentives could be implemented within the context of the NEA tax conference.

DISCUSSION: The tax incentive would provide a short term economic boost to advanced coal technologies in order to improve the competitive position of these technologies in the early 1980's. The incentive will provide both earlier industrial experience with the technologies and an improved capability for industry to increase rapidly its use of coal-based fuels as world oil prices rise.

The economics for all these technologies depend significantly on situation-specific factors, such as coal prices, distribution costs, capacity utilization factors, and site-specific designs. Generally, however, world oil prices would have to rise about $3-8/bbl for these technologies to be cost competitive without the tax incentive. FBC and "dirty" low Btu gas (without tars and sulfur removed) are most nearly cost competitive, but have limited applicability. Clean low-Btu gas (with tars and sulfur removed) and medium Btu gas would require $5-8/bbl world oil price increases to become generally economic without the added tax incentive. These cost premiums and uncertainties are very

situation-specific, but have inhibited application of these technologies.

The tax credit would apply only to the cost-related uncertainties associated with use of advanced coal technologies. The market penetration of all three technologies would be affected by the EPA emission requirements for industries. To the extent that environmental control equipment is required, the costs of environmental control could become a key factor in determining the economic competitiveness of these technologies. In addition, industry is not yet convinced that these new technologies would be a reliable source of fuel supply. Backup systems may be required in case of technical breakdown, adding substantial costs for using these technologies.

The major uncertainties for MBG are the reliability of the gas supply and the institutional arrangement for sharing the MBG among a number of industrial customers. These institutional and performance issues may have to be resolved, even under the favorable tax treatment provided in this initiative, before MBG would have substantial market penetration. The Department of Energy would seek to facilitate the organization and development of medium Btu coal gasification projects which may be accelerated by this initiative.

RENEWABLE AND END-USE
TECHNOLOGIES

RENEWABLE AND END-USE TECHNOLOGIES

PROBLEM: Responding to the diversity of renewable energy resources and end-use technologies requires a more visible and comprehensive effort to examine the most promising opportunities, and to demonstrate Administration leadership in this area. The impact of the NEP solar tax credit will likely be limited to active solar space and water heating technologies. Moreover, it is becoming increasingly clear that existing DOE programs need to be expanded to match the diversity and potential of small-scale energy technologies, and to tap the innovative potential of small businesses and individuals who have useful ideas.

PROPOSAL: To complement proposed tax credits for solar technologies, suggested program initiatives are:

- o Photovoltaics (Solar-electric cells)

  The current research program, which focuses primarily on flat plate silicon cell technology, would be expanded substantially to explore several promising new technologies, including: amorphous materials, photochemical conversion, and advanced concentrator concepts. This effort should insure that significant cost reductions are achieved by 1985. As the costs of competing fuels rise, photovoltaics should become cost-competitive with electricity for many applications by the late 1980's. The initiative would more than double current efforts to develop new materials, designs, and fabrication technologies ($30M FY79; $22M FY80; $140M total).

- o Wind

  Competitive procurements of utility scale machines (1-3 mw) would be made from two manufacturers. Development of the eight prototypes (two from each manufacturer) during FY 79-81 would be followed by a subsidized purchase of at least 70 machines by cooperating utilities. This is geared to a target of reducing wind electricity costs to about 3¢/kwh by FY 84. If successful, a sizeable commercial market should open up. Ultimate mature product costs are estimated at 1-2¢/kwh for megawatt-sized wind machines.

The Federal Government would purchase over 100 small (8-40kw) wind machines to resolve rate scheduling and operational problems with electric utilities and State and local governments. In addition, this initiative calls for developing two new types of small scale machines for use either with or without a utility grid backup.

This effort would complement existing R&D programs and the NEP tax credit. The FY 79 funds would be split $7 million for small machines and $13 million for large machines ($20M FY 79; $31M FY 80; $210M total).

o Gas and Liquid Fuels from Biomass

Efforts to date to produce clean liquid fuels from biomass have been narrowly focused on the production of alcohols. While this technology is relatively well known, alcohols produced would be expensive. But alcohol would be cost-competitive with coal-derived methanol in situations where the cost of biomass is quite low, as in agricultural waste.

This initiative would identify and develop a variety of alternative processes for converting wood into methane or directly into gasoline or other liquid fuels that closely resemble petroleum distillates. It would significantly expand the range of technological options available for producing clean gaseous and liquid fuels from non-petroleum sources ($10M FY 79; $10M FY 80; $60M total).

o Low-Head Hydro

There are over 50,000 existing dams that might be retrofit for hydropower production. Many of these are much too small to attract the attention of utilities, but it is estimated that 20,000 mw could be retrofit by the year 2000. A provision in the conference version of the NEA, requiring utilities to purchase power at nondiscriminatory rates from many private or municipal producers, is expected to improve the economic viability of producing electricity at small (50 kw-15 mw) existing dam sites.

This initiative includes $5 million to accelerate development of a domestic turbine industry by funding at least two manufacturers to develop small prepackaged turbogenerators. The development of standardized turbines is expected to reduce the cost of the average retrofit project from an average of $1,200 to about $1,000 per installed kilowatt. Since hydroelectric equipment is relatively long-lived, this reduction would correspond to a generating cost of only about 1.5¢/kwh.

The initiative is also intended to expand the NEA market-pull by providing loans for feasibility studies at about 400 existing dams. These loans, in addition to the 300 authorized by the NEA, would be forgiven if the site proves infeasible. To assist future developers in obtaining financing, the initiative provides for 15-20 utilization experiments to demonstrate the viability of retrofit projects under a variety of technical and institutional conditions. The total funding is allocated as follows: $40M for feasibility studies, $5M for turbogenerator development, and $55M for utilization experiments ($30M FY 79; $30M FY 80; $100M total).

o Appropriate Technology Small Grants

This program is designed to encourage individuals and small businesses to develop and demonstrate the feasibility of innovative new small scale technologies that conserve depletable resources or utilize renewable resources. The high visibility of this program is expected to aid rapid and widespread commercialization of "appropriate" technologies, which are typically labor-intensive, relatively simple, and rely on low-cost, locally available materials. The FY 78 pilot program conducted by one regional DOE office was met with 1100 proposals, including many of exceptionally high quality. Grants are limited to a maximum of $50,000; proposals have averaged $20,000 each. This initiative calls for expanding the program to a level capable of funding 1,500-3,000 proposals by FY 80 ($10M FY 79; $27M FY 80; $145M total).

o Dispersed Technology Demonstrations

This initiative would provide for widespread demonstration and evaluation of decentralized technologies utilizing renewable energy sources. The technologies included could range from self-sufficient, neighborhood-scale, wood-fuel systems to integrated renewable energy systems for business and industrial use. Emphasis would be placed on systems that utilize innovative combinations of known technologies, such as anerobic digestion, electrical and thermal storage and waste heat recovery. The initiative would complement existing DOE programs which are focused on demonstrating newly developed technologies, and the appropriate technology small grants program which is limited to a maximum of $50,000 per project. The proposed demonstration program would evaluate the suitability of these technologies under a variety of geographic, institutional and socioeconomic conditions. The demonstrations would be designed to encourage adoption of such techniques for applications as diverse as industrial parks, neighborhoods or entire communities ($5M FY 79; $10M FY 80; $55M total).

o Passive Solar Heating and Cooling

Because it is difficult to define the incremental costs of passive solar building components (e.g., specially designed walls, windows and structural members), the NEP tax credit proposal would not assist passive solar. The initiative would stimulate and publicize innovative but practical design concepts for passive solar through financial awards to architects and builders. Design and build competitions would be implemented first nationally, and then regionally through State Energy Offices, Regional Solar Energy Centers, or DOE Regional Offices. Projects would be judged according to guidelines based on marketability and energy saving ($5M FY 79; $7M FY 80; $40M total).

o Solar Space and Water Heating

The NEA would provide $100 million over 3 years for the Federal Government to purchase solar heating and

cooling systems for Federal buildings. The primary purpose of the program is to demonstrate the Federal government's confidence in solar energy. This initiative would introduce the concept of leveraged purchasing into the program, restricting government purchases to those vendors whose sales to the government are matched by a specified volume of sales to the private sector. The Department of Energy will begin discussions immediately with representatives of solar industries, other Federal agencies, and other interested parties to determine the feasibility of leveraged purchasing and other procurement guidelines that would promote the development of a viable, competitive industrial infrastructure for solar energy. (no budget increment required)

- o Solar Training and Education

Market forces and the prospect of solar tax credits should spur the rapid development of a solar heating industry. However, the lack of skilled personnel for installing solar systems inhibits the industry's growth. This initiative would make funds available to organizations such as labor unions, community colleges and schools, and trade associations to establish training programs. The programs would be terminated after two years when self-sustaining solar training programs are established ($5M FY 79; $3M FY 80; $8M total).

- o Residential Oil Burner Replacement

Current DOE efforts focus on the laboratory testing of existing and new oil burners and on the development of field-testing equipment. This initiative would expand the existing effort to design, fabricate, and test new burners both in the lab and in the field, field test existing burners, develop and disseminate information on the effectiveness of efficient burners, and develop and implement an installation and service training program at two or three locations where oil use is high. The estimated cost of retrofitting an oil furnace with an efficient burner is $150 to $300. The retrofitting should pay for itself in two or three years. If all existing oil furnaces were retrofit by 1990, oil savings of over 250 MBD could be achieved.

This initiative, combined with the NEA tax credit and utility retrofit program, is designed to insure that a substantial fraction of these potential savings are actually achieved ($2M FY 79; $4M total).

DISCUSSION: Prior to 1990, the energy savings from these initiatives would be relatively small. The technologies have relatively short lead times, however, and construction and energy savings could grow rapidly once the technologies become cost-competitive. Long-term estimates have been limited because of uncertainties surrounding most of the technologies. With the exception of the job training initiative for solar heating, all the program initiatives are intended to achieve substantial cost reductions through further R&D and innovation.

The means for securing these cost reductions are as diverse as the technologies themselves. For some technologies, a simple expansion of R&D activities is the best way to reduce the cost of obtaining energy from renewable resources. For technologies closer to commercialization, the early establishment of market incentives would be effective in stimulating additional R&D and innovation in the private sector, unconstrained by a government-defined scope of work. To accomodate the diversity of renewable energy technologies and to tap the innovative potential of individuals, entirely new approaches must be taken. For passive solar, dispersed and appropriate technologies, small grants and awards for innovation by individuals, administered in a decentralized fashion, are expected to add a large number of small improvements to the Nation's energy production and use system.

For photovoltaics, the new R&D initiative would complement public and private procurements planned for the future. This will significantly increase the likelihood that one or more of the technologies will exceed cost reduction goals by 1985. The biomass R&D program would identify and develop entirely new technologies for producing clean fuels from biomass that could compete effectively in the market place.

Finally, for wind and low-head hydro, the initiatives are designed to increase production in order to reduce costs, to demonstrate a wide variety of technologies, and to give the private sector experience with these technologies.

SUMMARY OF INITIATIVES

INITIATIVE	TYPE	COMMENTS
LIQUIDS		
Shale Oil Production	Tax incentive	Limited to first 10MBD for plants placed in service before 1987.
Enhanced Oil Recovery	Pursue price and loan guarantees EOR to receive world oil price	
Synthetic Liquids Commercialization Demo	Design Studies on SRC-I and SRC-II	Six-month studies, then decide on construction.
GAS		
Unconventional Natural Gas	Price incentives Accelerated Development	Principally resource characterization
High-BTU Coal Gas	Case-by-case review on FERC intervention and/or loan guarantee	
COAL		
Advanced Coal Technologies	Investment tax credit and accelerated depreciation	Fluidized Bed Combustion and low and medium-BTU gasification
RENEWABLE AND END USE TECHNOLOGIES		
Photovoltaics	Research increase	
Wind	Development of prototypes and competitive procurement	Both large and small machines
Biomass	Research and development increase	Gas and Liquid Fuels
Low-Head Hydro	Budget increase	Feasibility studies; turbogenerator development; utilization experiments

INITIATIVE	TYPE	COMMENTS
RENEWABLE AND END USE TECHNOLOGIES (continued)		
Appropriate Technology	Grants	Max. $50,000 per grant
Dispersed Technology Demonstration	Budget increase	Demonstration and evaluation of dispersed renewable technologies
Passive Solar	Design Awards	
Solar Space and Water	Federal purchase	Leveraged purchasing
Solar Training	Budget increase	2-year program to train trainers
Residential Oil Burner Replacement	Budget increase	Design, fabricate, test new burners and disseminate information
LIQUIDS DISCUSSION ITEM		
Synthetic Liquids Utilization	Regulatory requirment	Percentage of all liquids consumption required to be domestically-produced synthetics

FY 1978 ENERGY SU[illegible] INITIATIVES
BUDGET INCREASES
(BUDGET AUTHORITY)
$ In Millions

	FY 1979 Budget	FY 1979 Initiative	FY 1980	FY 1981	FY 1982	FY 1983	FY 1984	Cumulative FY 1979-84
LIQUIDS								
Synthetic Liquids Utilization Program	0	0	0	0	0	0	0	0
Enhanced Oil Recovery Purchase	0	0	0	0	10	20	25	55
Oil Shale Tax Credit and Purchase	0	0	0	0	NA	NA	NA	NA
Synthetic Liquids Commercial Demonstrations								
Solvent Refined Coal[17]	23	192	156	75	61	96	64	644
Subtotal--Liquids	(23)	(192)	(156)	(75)	(71)	(116)	(89)	(699)
GAS								
Unconventional Sources:								
Geopressurized & Hydropressured	18	18	33	18	0	0	0	69
Tight Gas Sands	6	5	15	0	0	0	0	20
Devonian Shale	12	2	5	0	0	0	0	7
Methane from Coal Beds	4	2	5	0	0	0	0	7
Subtotal--Unconventional	(40)	(27)	(33)	(0)	(0)	(0)	(0)	(103)
High Btu Gas (Loan Guarantees)	0	30	248	146	102	0	0	526
Subtotal--Gas	(40)	(57)	(306)	(164)	(102)	(0)	(0)	(629)

	FY 1979 Budget	FY 1979 Initiative	FY 1980	FY 1981	FY 1982	FY 1983	FY 1984	Cumulative FY 1979-84
DIRECT COAL USE								
Atmospheric Fluidized Bed (Tax Credit)[2/]	0	0	0	0	0	0	0	0
Low/Medium Btu Gas (Tax Credit)[3/]	0	0	0	0	0	0	0	0
Subtotal--Direct Coal Use	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
RENEWABLE AND END-USE TECHNOLOGIES								
Photovoltaics	76	30	22	22	22	22	22	140
Wind	41	20	31	28	60	46	25	210
Gas & Liquid Fuels from Biomass	27	10	10	10	10	10	10	60
Low Head Hydro[4/]	8	30	30	20	15	5	0	100
Appropriate Technology (Grants)	3	10	27	27	27	27	27	145
Dispersed Technology Demonstrations	0	5	10	10	10	10	10	55
Passive Solar Heating & Cooling	2	5	7	7	7	7	7	40
Solar Education & Training	0	5	3	0	0	0	0	8
Residential Oil Burner Replacement	1	2	2	0	0	0	0	4
Subtotal--Renewables and End Use	(158)	(117)	(142)	(124)	(151)	(127)	(101)	(762)
Total = Energy Supply Initiatives	221	366	604	363	324	243	19o	2090

1/ Figures represent the incremental funding necessary to accelerate SRC II beyond the level of funds included in current commitment projections.
2/ Net present value of the Treasury loss is estimated to be $150 million through 1985 (incremental above the NEA).
3/ Net present value of the Treasury loss is estimated to be $115 million through 1985 (incremental above the NEA).
4/ Figures represent increment over NEA conference draft which provides $10 million for each of 3 years for feasibility studies. We do not support the $100 million for construction loans also in the draft.

NA: Not available depends on what purchases, if any, are required.

APPENDIX I

APPENDIX I

ANALYSIS OF SYNTHETIC LIQUIDS UTILIZATION PROGRAM

With the 700 MBD to 1,200 MBD barrels per day 1990 capacity the requirement creates, the Nation can respond much more rapidly to sudden price rises or supply scarcity. Table 1 illustrates this springboard effect. These estimates assume no unusual approval delays, the elimination of price controls, and no environmental production limits; they do account for technical evolution, current environmental control technology, and typical approval and construction times.

Even if the program benefits society in the long run, consumers will pay for the higher costs of synthetics in the near term. The annual costs to consumers of the 700 MBD program range from $3.8 billion/year in 1990 if oil prices remain low and synthetic fuels are costly to zero if oil prices rise and synthetic fuels are too expensive (see Table 1).

If synthetics remain more costly and oil prices do not rise, the initiative would be sightly inflationary because it raises product prices. The competitive position of the U.S. petrochemical industry, could be affected; particularly its export-import balance (now $6 billion per year favorable to the U.S.). Petrochemicals manufacturers are especially concerned about the incremental effects of the program once U.S. oil prices reach world levels, eliminating most of the competitive price advantage they now enjoy.

Capital investments required by the program run roughly $20,000 - 30,000 per daily barrel capacity -- e.g., $1 to $1.5 billion for a 50 MBD plant. The investments required for 700 MBD production thus amount to roughly $14 to $21 billion for 14 plants. For 1,200 MBD production, roughly 24 plants are required, with investments of approximately $24 to $36 billion. The amounts required for individual plants exceed the capability to raise capital of all but a few of the largest oil companies. Even the $100 million required for a ten-percent share of a plant would exceed the risk-capital limits for all but the two or three largest chemical companies. Additional incentives to assure capital availability to individual companies may be necessary to promote competition.

Key Issues

Key issues this program raises include:

- o the efficacy of the requirements approach;
- o the credibility of any significant 1990 target level, given the uncertain technical state of key technologies and potential environmental production limits and delays;
- o the fairness and workability of the requirements approach if current incompatible regulations are kept or if likely exemptions are granted.

The firms that this program would affect have expressed serious doubts about the efficacy of this regulatory approach. To many, the legislated 1990 requirement for firms to produce synthetic liquids appears too tenuous and indirect an inducement for producers. Producers require a certain market to build extremely expensive facilities that, without the requirements, would very likely be uneconomic. But government regulation, they maintain, is too subject to change. Even if this Administration and the 96th Congress approve rigorous requirements, the next Administration and the 100th Congress could relax or remove them.

If the schedule could be made to appear firm, certainty could dominate efficiency in the choice of technologies. Many companies say they would choose existing technologies (e.g., alcohols and Sasol-type coal liquids) rather than take chances on as yet unproved technologies that could be more economic. Under the regulation, production at specific times, rather than economics, would determine compliance and near-term success. The requirements approach thus could lead to a more conservative and expensive mix of technologies than market forces (aided by financial incentives) would tend to produce.

Similarly, it may be difficult to make credible any significant 1990 target level. Unforeseen technical problems and environmental approval delays may make any significant 1990 goal unattainable -- or attainable only at costs considerably higher than those estimated earlier. The 1990 requirements would have to be set rigidly now to enable producers to secure loans or to commit stockholders' captial. But the liquids available now are comparatively expensive, and it could be risky to set requirements now for production from technologies not yet commercially demonstrated.

Equity questions also challenge the target's credibility. Some purchasers could have to pay very large fines if other companies' plants supplying them were late coming on stream or shut down because of technical or environmental problems. If fines were $15 per barrel (as they might need to be initially), for example, slippage of 100 MBD would impose fines on them of over $500 million.

Environmental issues appear likely. Synthetic liquids technologies have air and water quality impacts that will require careful analysis and tradeoffs at each site. Health effects and potential effluent toxicities are not well understood. Thus many feel that development should be cautious and slow. Even where environmental regulations do not actually limit production, environmental caution could add uncertainty to schedules and to the value of investments. These considerations may be especially apparent in the five-to-six county oil shale region in Colorado, Utah, and Wyoming. Since shale oil is now expected to be the cheapest synthetic liquid, severe limits on shale production would reduce notably the production achievable from this program and its benefits to the nation.

Though basically straightforward, the percent requirements could acquire a large number of exemptions and special provisions during the legislative process. Experience with the entitlements and import fee programs suggest that pleas for special treatment can be expected from small refiners, offshore refiners, petrochemical firms, and New England, among others. One virtue of this initiative is its equitable treatment of all crude users and petroleum product importers, and the fairness of having all liquids users pay for the needed subidies. Exemptions and special provisions would remove this feature.

This new regulatory program would not mesh well with existing price control and entitlements regulations. If they were retained, or replaced by similarly incompatible regulations, the percent requirements could become complex and would be perceived as unworkable.

TABLE 1

Insurance Value of Initiative in Responding to Major Oil Price Rise
(Assumes No Price Controls or Environment Constraints)

Oil Price in 1990 (1978 $/Bbl.)	Synthetic Costs	Year-2000 Synthetics Production Without Initiative (MBD)	With Initiative (MBD)	Net Present Value (Billions of 1978 $)
15	Low	285	700 **	- 7
15	High	115	700 **	-19
25*	Low	1,360	1,910	+23
25*	High	760	1,210	+ 9

* Assumes oil prices rise from $15/bbl to $25/bbl between 1980 and 1990 and remains at $25/bbl thereafter.

** Assumes requirement maintained to 2000 at 1990 level.

The 1990 world oil price at which the initiative breaks-even (i.e., neither costs nor saves financially on net) would be roughly $16 per barrel if synthetics costs prove to be at the low end of current estimate ranges and would be roughly $17 per barrel if synthetics costs turn out to be at the high end of the range. The analysis assumes a 6% real discount rate and assumes that a reduction in U.S. import levels of 1 MMBD will reduce world oil prices by $0.50/bbl if world prices rise above $15/bbl.